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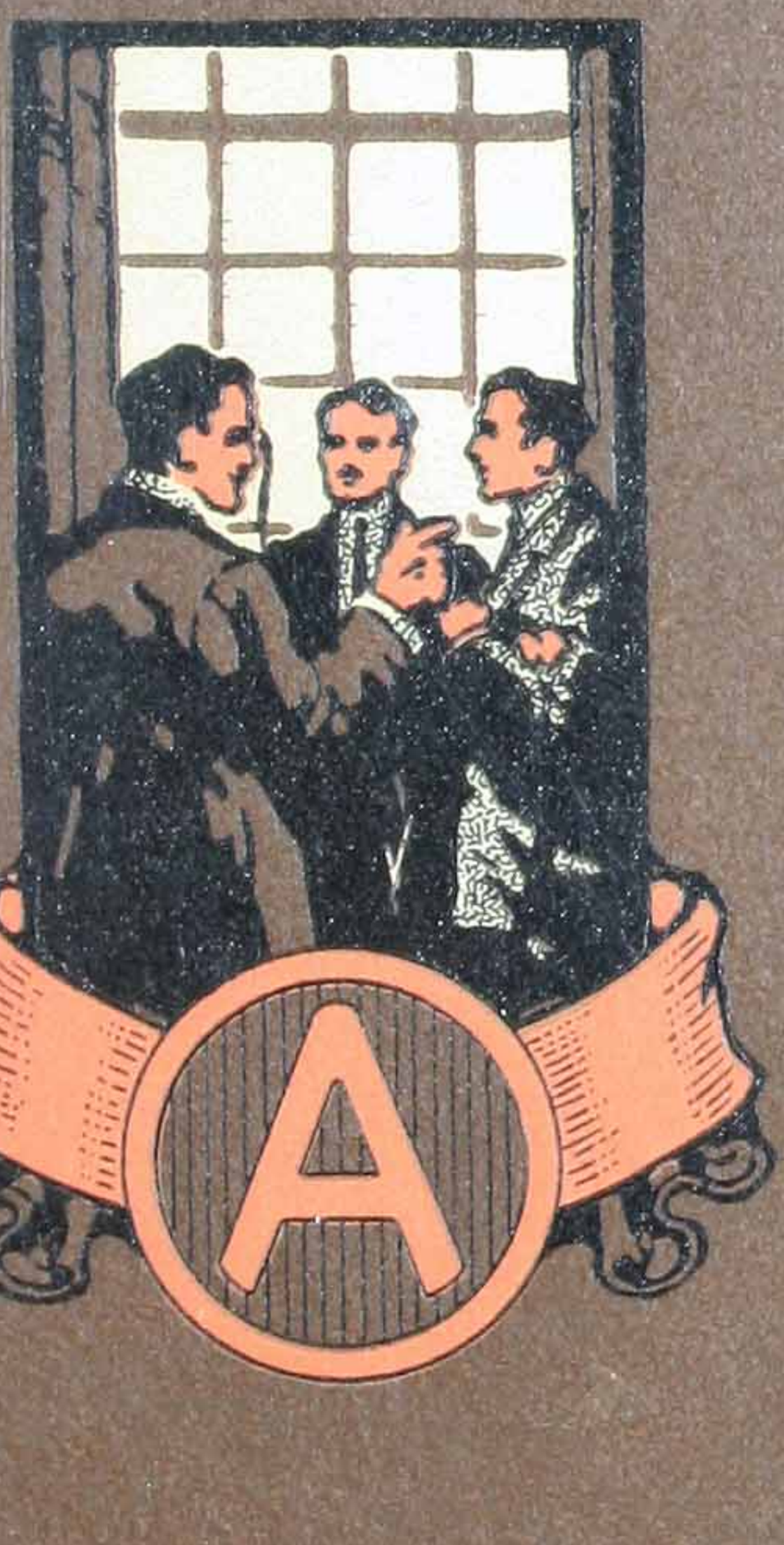
TOLD in the STORE



TOLD in the STORE

An Interesting Tale of a Buyer's Experience

ARMSTRONG CORK COMPANY
LINOLEUM DEPARTMENT
LANCASTER, PA. U. S. A.

SECOND EDITION

TOLD in the STORE

The clock in the church steeple some blocks away, struck five. The store would close in half an hour. Stock had been straightened, and already the salesmen were planning their departure. Here and there a belated customer hurriedly inspected carpets or linoleums, her mind more actively engaged with the thought that dinner time was less than an hour away, and the master of the house might be kept waiting.

The dull drowsiness of a summer afternoon had settled over the floor covering department of the Bigger store. A general air of quiet prevailed, except for an attentive group in the rear of the room, listening to an animated speaker. Tom Howe, the department buyer, is saying:

"Yes, that trip through the linoleum factory certainly opened my eyes. Some of you might think because I've been buying and selling linoleums for twenty years, I knew it all. I only wish you boys," addressing the salesmen grouped about, "had been with me."

"Tell us about it," chorused three or four, and others who had fringed the group drew forward expectantly. "I haven't much time," replied Mr. Howe, "but if you really want to know, I'll tell you just as briefly as I can."

"Go on," came from half a dozen.

"Well," the speaker resumed, "I finished my work sooner than I expected on my last trip to New York and thought I'd rest up a little. As I was turning over the relative merits of several coast resorts in my mind, George Swayne, the Selling Agent for Armstrong's Linoleum offered this suggestion:

" 'Why don't you run over to our factory in Lancaster, for a few days and look around? You can get more genuine rest there than you'd ever get at the summer resorts, and besides you could pick up a lot of valuable pointers. Lancaster's just the right kind of a town for a fagged-out chap like you, and I bet the men at the factory 'll make you feel at home before you've been there five minutes. If you don't have one of the best times of your life and one of the most profitable, too, I miss my guess.'

"Now, I'd often thought I'd go through a linoleum factory. I realize that the best way to find out things is first hand, but I'd never had time. But, believe me, I'm going to take more

In a few minutes
we were out at the plant

factory trips. I learned a lot about linoleums in a couple of days down there, that I never knew before."

"Tell us about the factory," said one of the salesmen, and Mr. Howe, not noticing the interruption, continued:

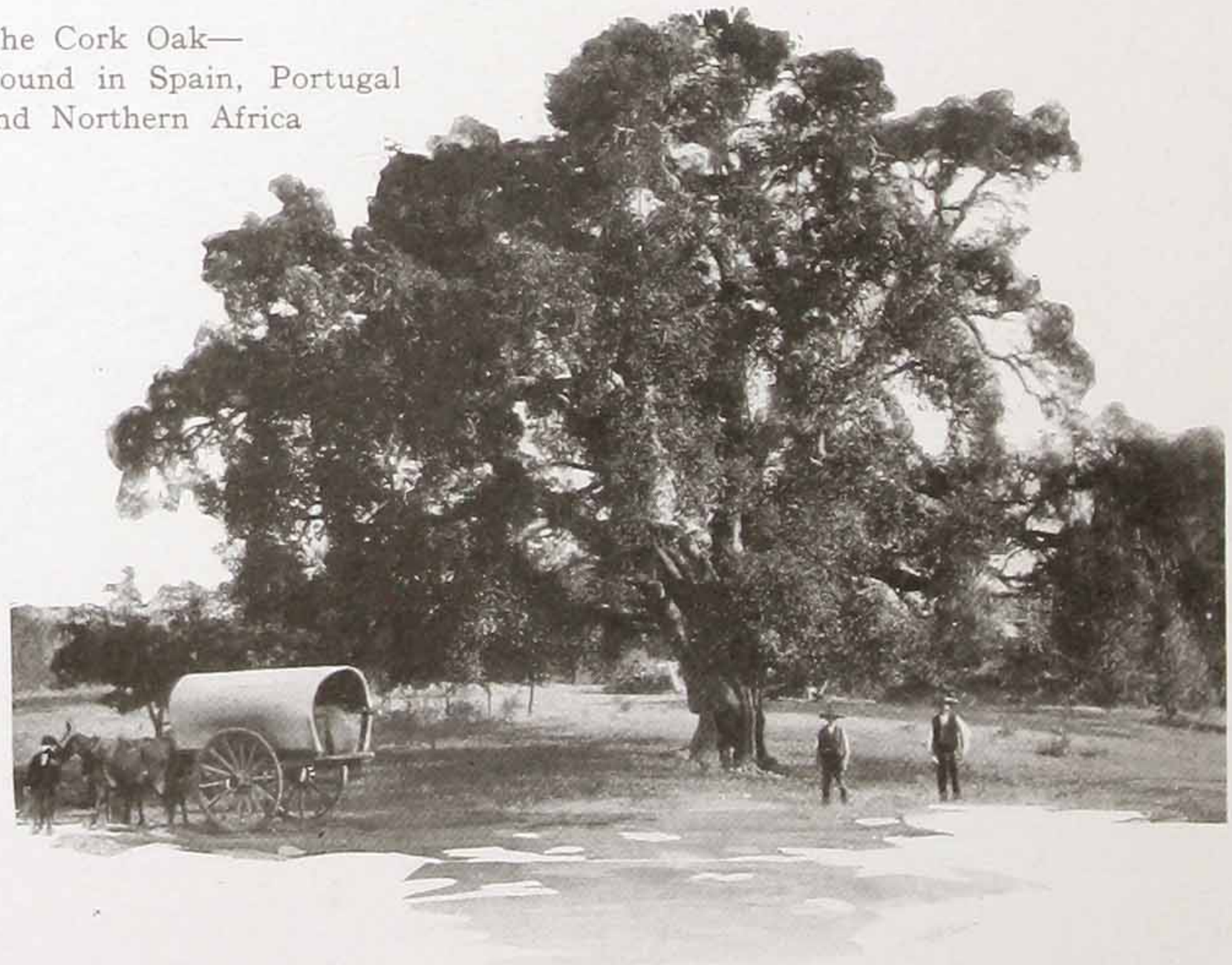
"Well, I went to Lancaster and the town was all I expected. It's one of those quaint old places where you can almost imagine yourself back in Revolutionary days. However, I didn't have much time to think about my surroundings.

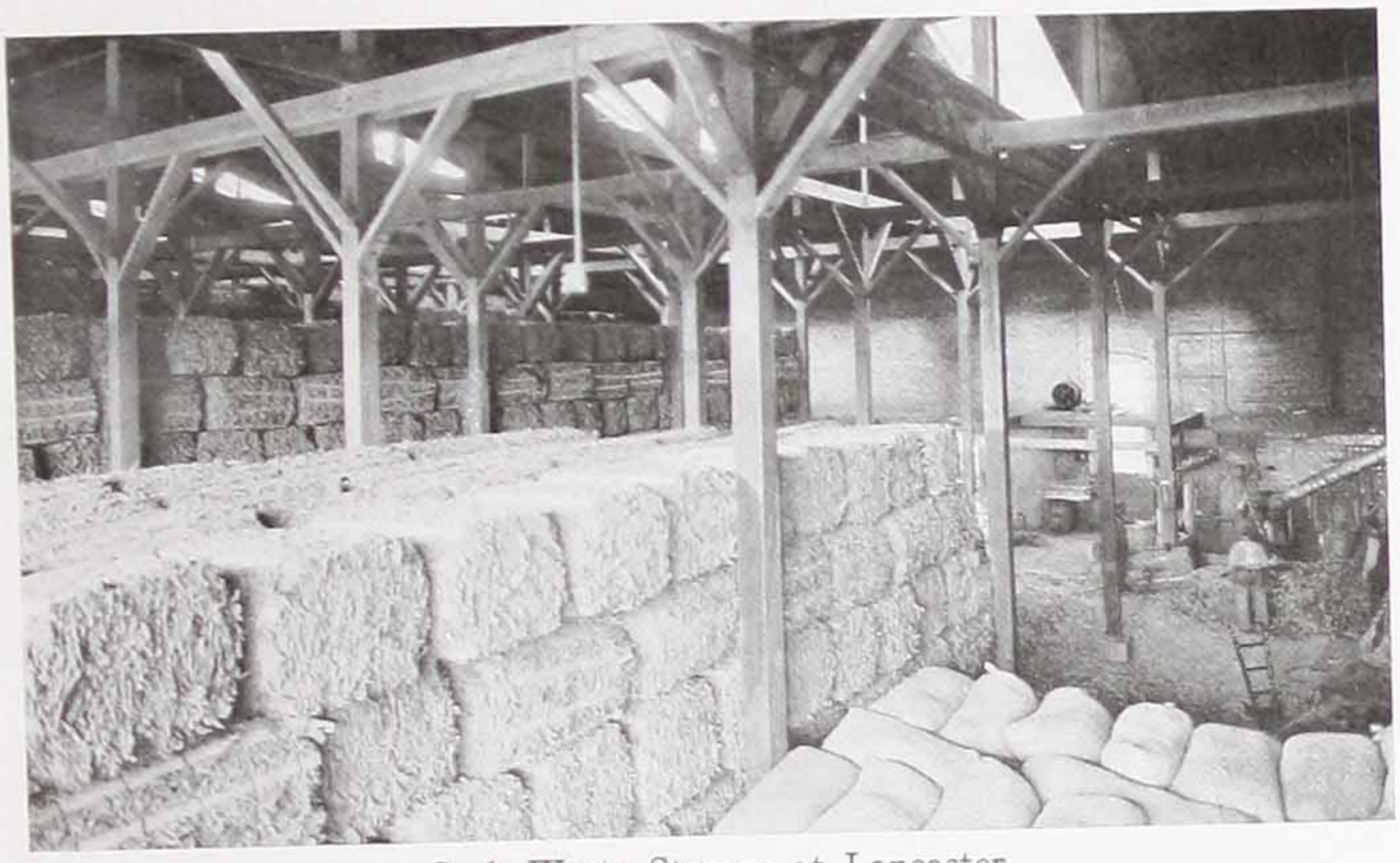
"I'd hardly reached the hotel when an auto called for me, and in a few minutes we were out at the plant. They sure have a great location —about thirty acres of ground—plenty of room to spread—with railroads on both sides. I guess there must be twenty-five or thirty buildings—counting them all—big and little."

The closing gong sounded and Mr. Howe hesitated to see what effect it would have. No one seemed to have heard it, so he went on:

"Well, first we went to the receiving track. Most everything comes in car lots. Here the strings of cars stood on sidings, placed just right for convenient unloading. It's certainly funny how things get together. Here was cork from Spain and Portugal, burlap from Scotland and linseed oil from Dakota, all on the same track. They tell me there's hardly a country on the globe that doesn't furnish something for linoleum.

The Cork Oak—
Found in Spain, Portugal
and Northern Africa



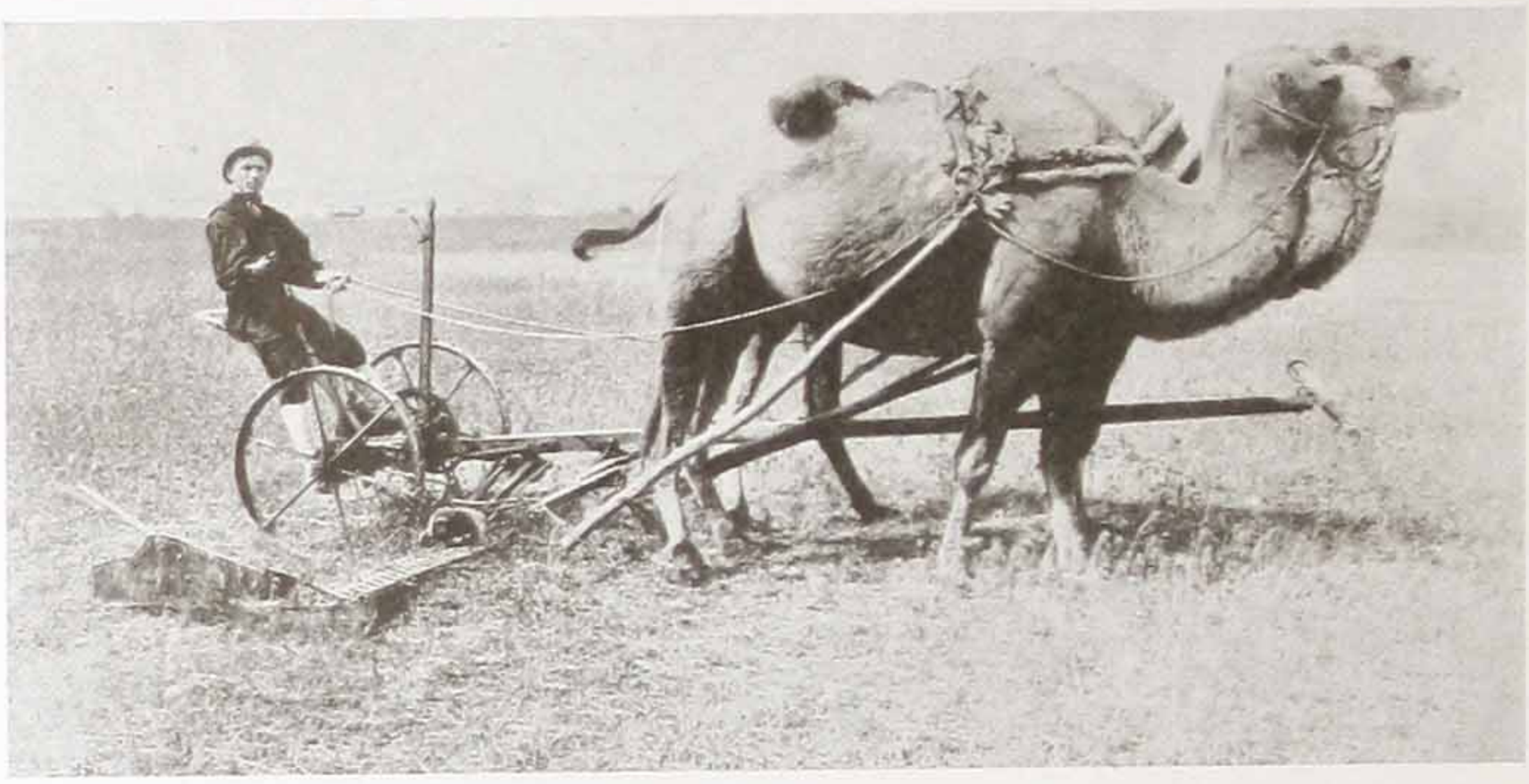


Cork Waste Storage at Lancaster

"Now, we can't follow all of these things through the factory at once, so suppose we take cork for a starter."

"Is this the same kind of cork that bottle stoppers are made of?" asked one of the salesmen.

"Exactly," replied Mr. Howe, "except that it's what's left after corks and other cork products are made. You know Armstrong's make a great many different things from cork. I believe they have about a dozen factories altogether, here and abroad. The scrap cork from these factories is just right for linoleum. They get all they use from their own plants; said it was cleaner and better as a rule than if they bought from outsiders.



Mowing Flax in Western Siberia—Linseed oil is made from flax seed

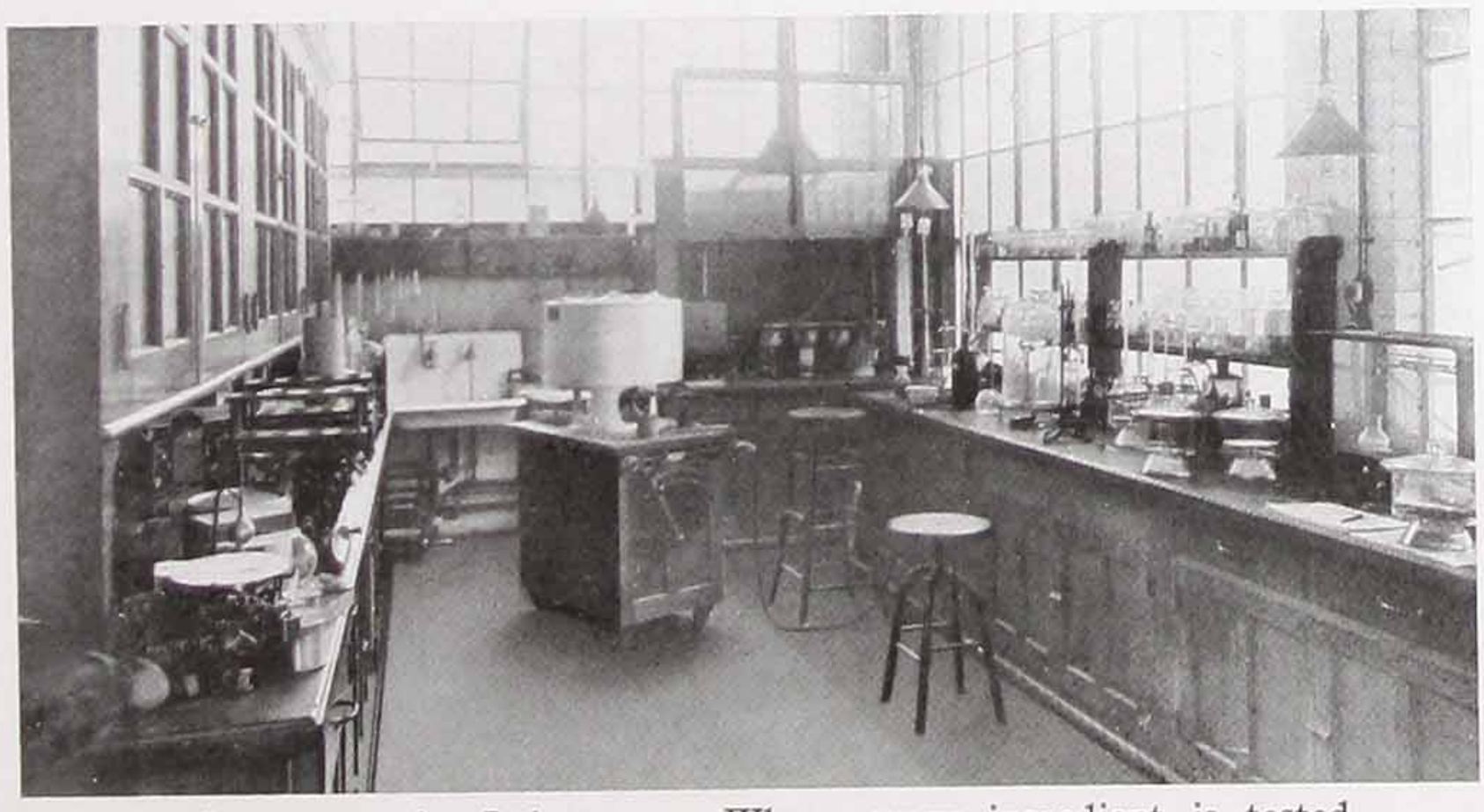
"Well, this cork comes in bales of about 250 to 400 pounds each, which are broken up in the receiving shed. The loose cork is then conveyed to a bin in the top of the cork mill. This bin feeds through chutes into burr mills where the cork's ground like flour. Next, it goes to the bolting machines and is run through a series of wire sieves, and when it comes out of the last one, it's as fine as powder. In fact, they call it cork flour. They take it then to the mixing building where—but wait a minute, we'll have to go back and get the things it's to be mixed with.

"As you probably know, the other most important ingredient of linoleum is linseed oil. Well, it comes in down there at Lancaster in tank cars—thousands of gallons at a time—direct from the refineries. The first thing they

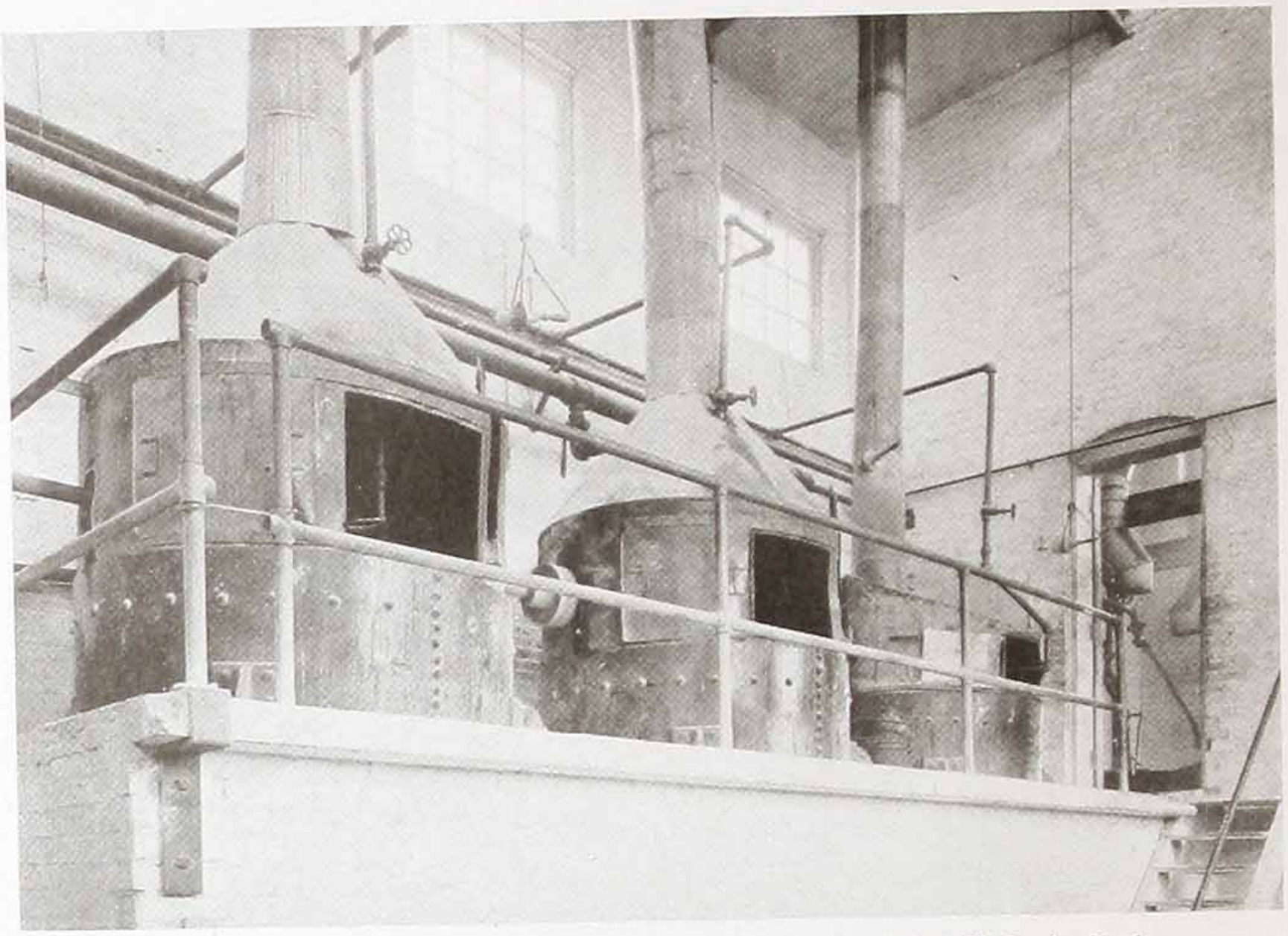
do is to take a sample from every car and test it in their chemical laboratory. Every gallon they buy must be right up to standard. They tell me poor oil can cause more trouble than almost anything else, so they take every possible precaution to guard against it. They sure do keep their chemists busy. There are so many things besides the oil, such as gums, colors, etc., to test."

"Do they test everything?" asked one whose whole attitude betokened interest.

"Yes, they do," was the response. "It seemed to me like a lot of unnecessary trouble, but they told me it was the only way they could be absolutely sure that everything was up to grade. When you come to think of it, maybe that's one reason we haven't had any kicks on how Armstrong's Linoleum wears.



A Corner in the Laboratory—Where every ingredient is tested



One of the Boiling Houses—Where the linseed oil is boiled

"Another peculiar thing I never heard of before is that oil's bought by weight—so many pounds to the gallon. It's pumped from the tank cars into a weighing house and then into big storage tanks that'll hold from five to eight cars apiece.

"The next step is the boiling house—all the linseed oil is bought raw and they boil it differently for different purposes. The temperature ranges anywhere from 350 to 500 degrees."

"Isn't it apt to burn?"

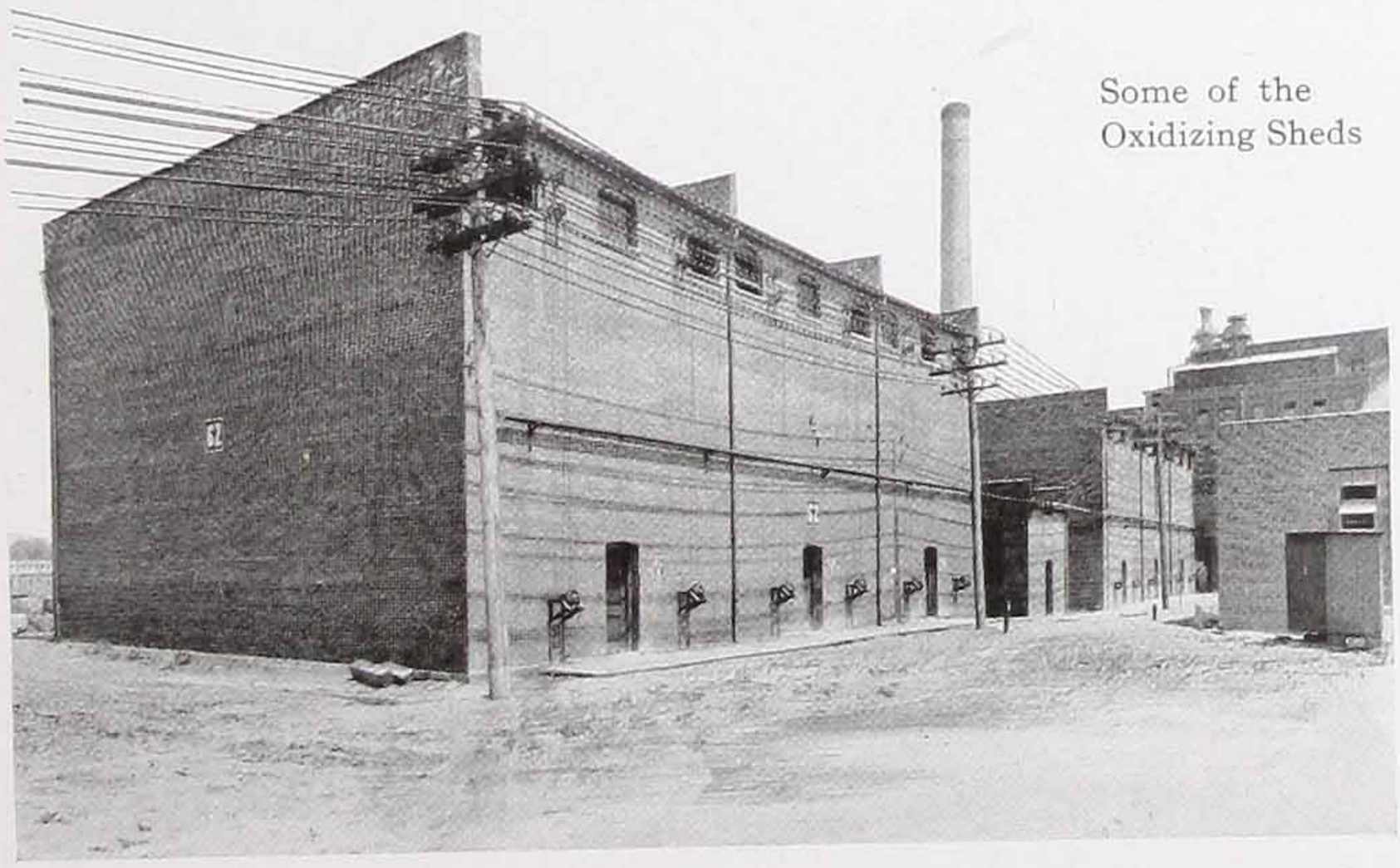
"No. The boilers are arranged on tracks so that if they should get too hot, they can be

removed from the fire quickly. Then they keep stirring the oil all the time, and of course, they watch the thermometers in the kettles closely.

"Now, you've probably all wondered why linoleum wasn't cheaper. I know I have. But when I saw how long it took, how many things went into it and how careful they had to be in making it, I was surprised that it didn't sell for twice as much.

"Now, here's another strange thing—mixing oil and air. Sounds as though it couldn't be done, doesn't it? Well, this is the way they do it.

"The boiled linseed oil is pumped into movable conveyors in the top of the oxidizing sheds, which are about thirty feet high. These con-



Some of the Oxidizing Sheds

A Glimpse Inside One of the Oxidizing Sheds—Note the edges of the sheets of scrim on either side

veyors have little holes in the bottom and as they travel from one end of the sheds to the other, the oil runs through onto sheets of scrim that are hung from the ceilings clear to the floors.

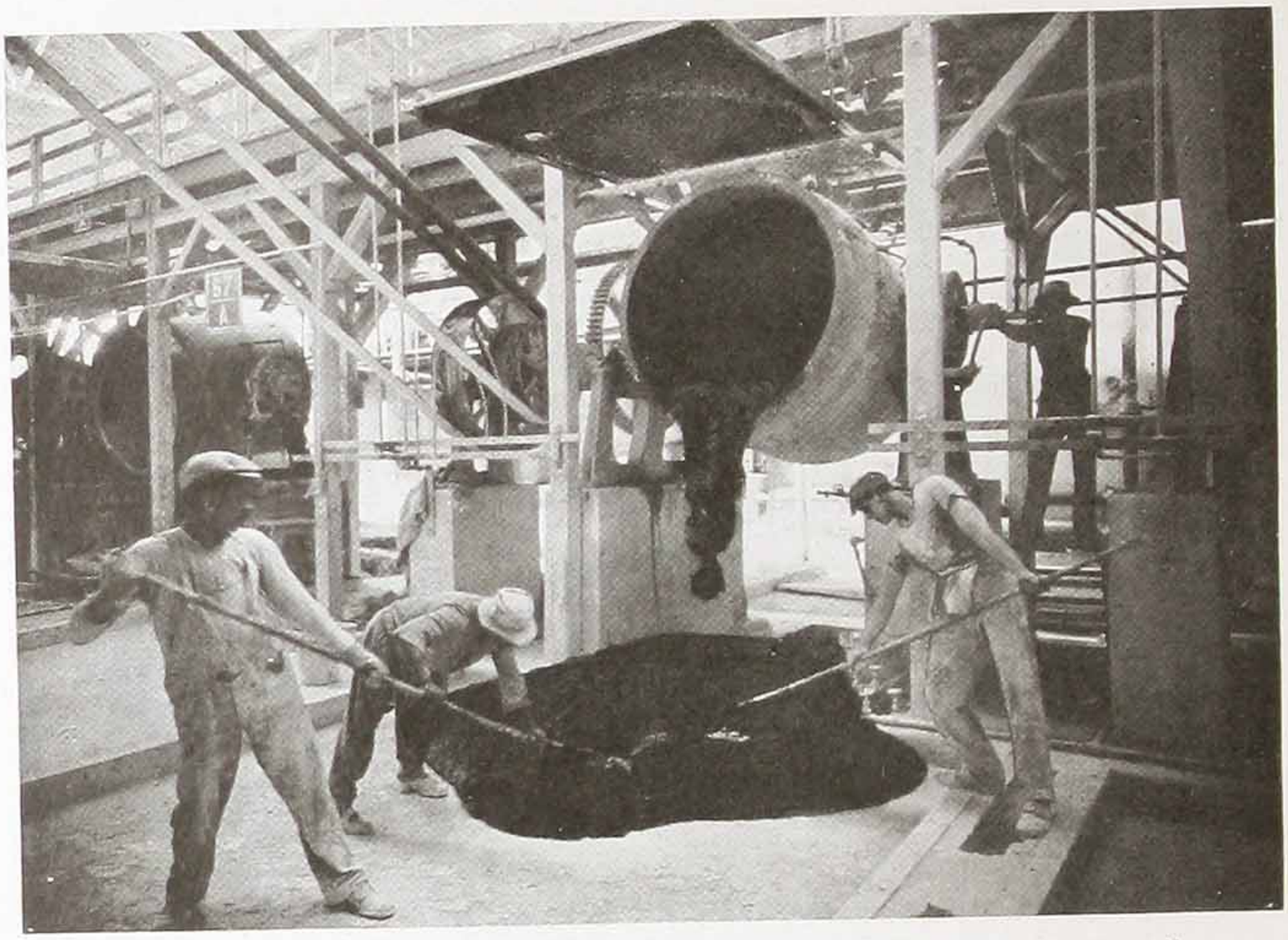
As it runs down these sheets, it gradually absorbs oxygen from the air. That's the reason they call these the oxidizing sheds. It's hot in there, too, about 80 to 100 degrees, and the heat and oxygen together turn the oil into a semi-solid form, that looks a good deal like caramel candy."

"No, I didn't taste it. The looks couldn't fool me that much.

"You've noticed the skin that forms on the top of a pail of paint when you leave the cover off. Well, practically the same thing happens to the oil in the oxidizing sheds. The oil's allowed to run down on the scrim twice a day for two or three months till the coating becomes nearly an inch thick. Then they take the sheets down and dust them with whiting so they won't stick together. As you can see, this method of oxidizing oil's a very tedious process, but they told me it made the linoleum smoother, tougher and more durable.

"They call these pieces of oil and scrim—'skins'—but they don't stay in the shape of 'skins' very long. Over in the cement plant where they go next, they're run through metal rollers and reduced to pulp."

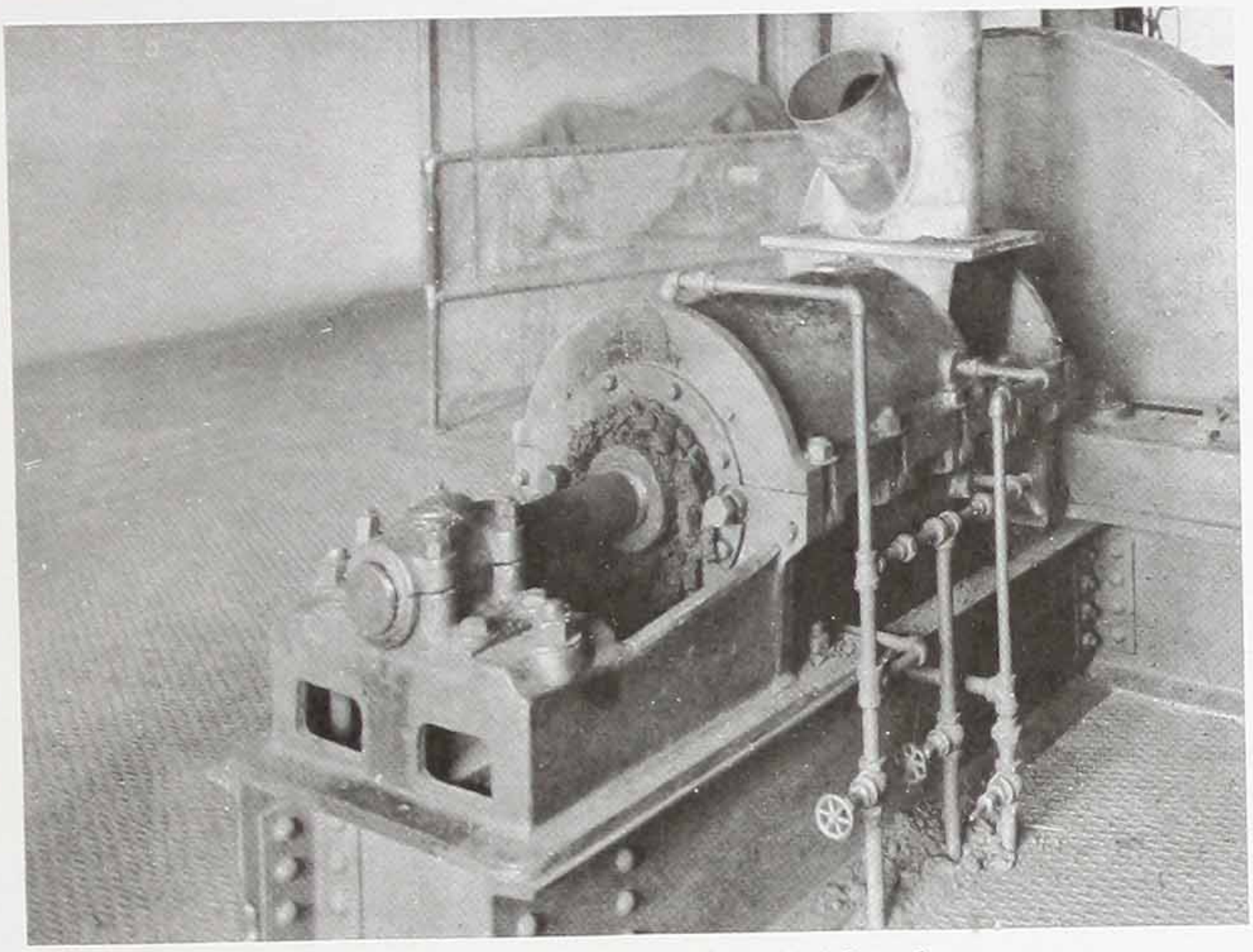
"I didn't know they used cement in making linoleum," came from one of the salesmen.



Pouring out a Batch of Cement to Cool—The linoleum "cement" binds the particles of cork together

"Well, they don't," replied Mr. Howe. "That is, not the kind you mean. This cement's different from that used for sidewalks. Cement, as they call it, is simply the binder to hold the pulverized cork together. Here's the way it's made:

"The oxidized oil is cooked in big kettles that hold about three tons apiece. While it's boiling, they put in rosin and a lot of other things including kauri gum, the fossilized sap of pine trees, dug out of the ground in New Zealand. Then when it's boiled just enough, it's poured out into concrete basins to cool. When it's cooled, they cut it up into chunks about a foot

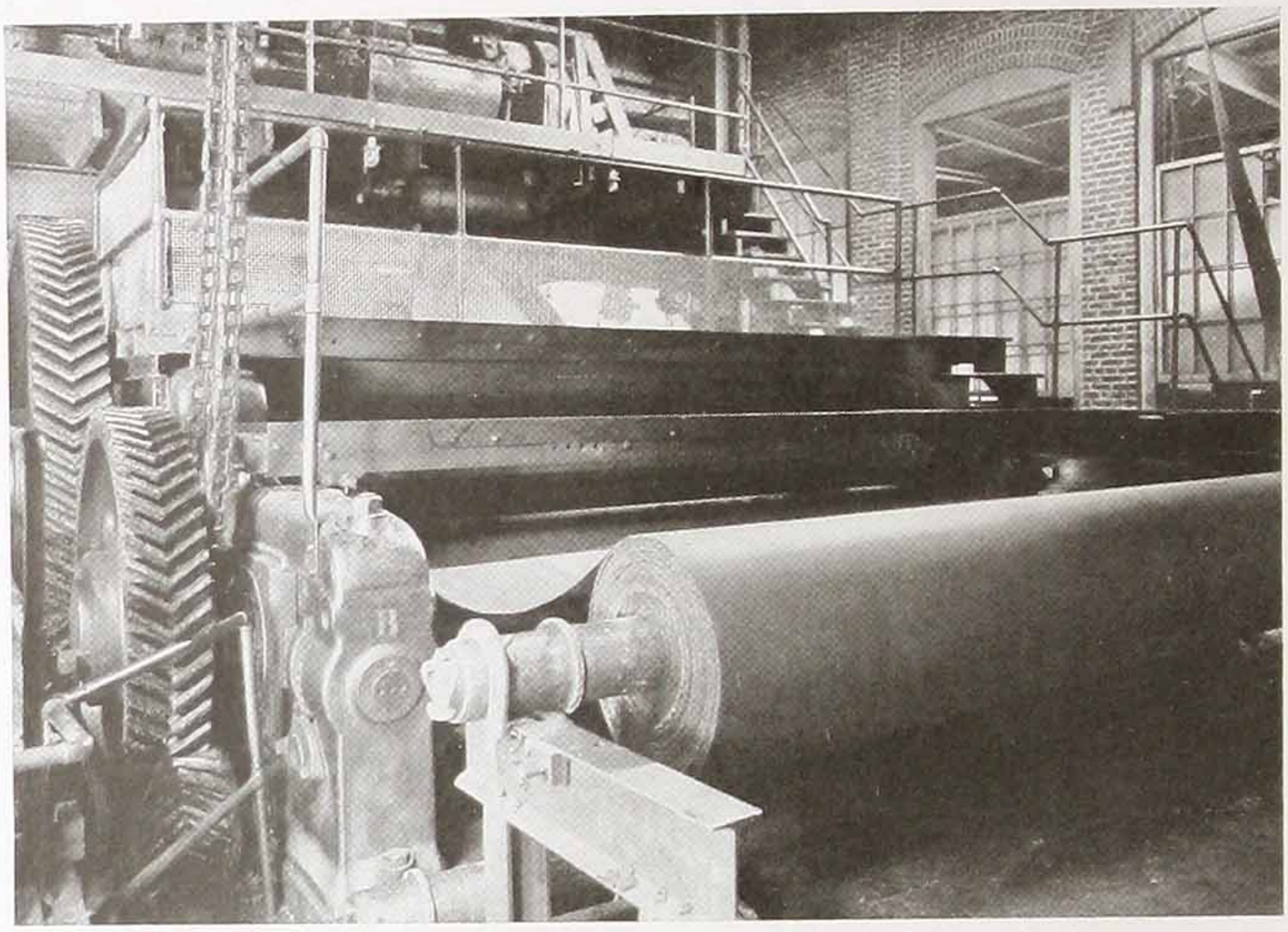


One of the Mixers—Like an old-fashioned sausage machine, only bigger

square and four or five inches thick, that look and feel just like big marshmallows, and send it along to the mixing building to be mixed with the cork flour.

"Now, I don't want to keep you fellows all night. If any of you have anything to do, go ahead. You won't make me feel bad."

Mr. Howe paused, but no one stirred and he resumed: "Well, in the mixing building these chunks of cement are cut up and fed into the mixers with cork flour. These mixers look like old-fashioned sausage machines, except, of course, they're bigger. They grind out a plastic mass that looks like wet clay and this is ground over



A Calender—This machine presses the "mix" and the burlap together, forming linoleum

and over till the cement and cork are thoroughly mixed. Seemed to me they might cut out one or two of these grinders and save time, but I guess they know what they're doing.

"Then the mix is pulverized again and drops to the calendering machine. This calendering machine is a series of heated steel rollers weighing about twenty-six tons each. The cork and cement mixture comes in at the top and the burlap at the bottom, and the two are pressed together between these rollers so tight there's no danger of their ever coming apart.

"And, here's a wonderful thing. This immense machine that really looks clumsy because

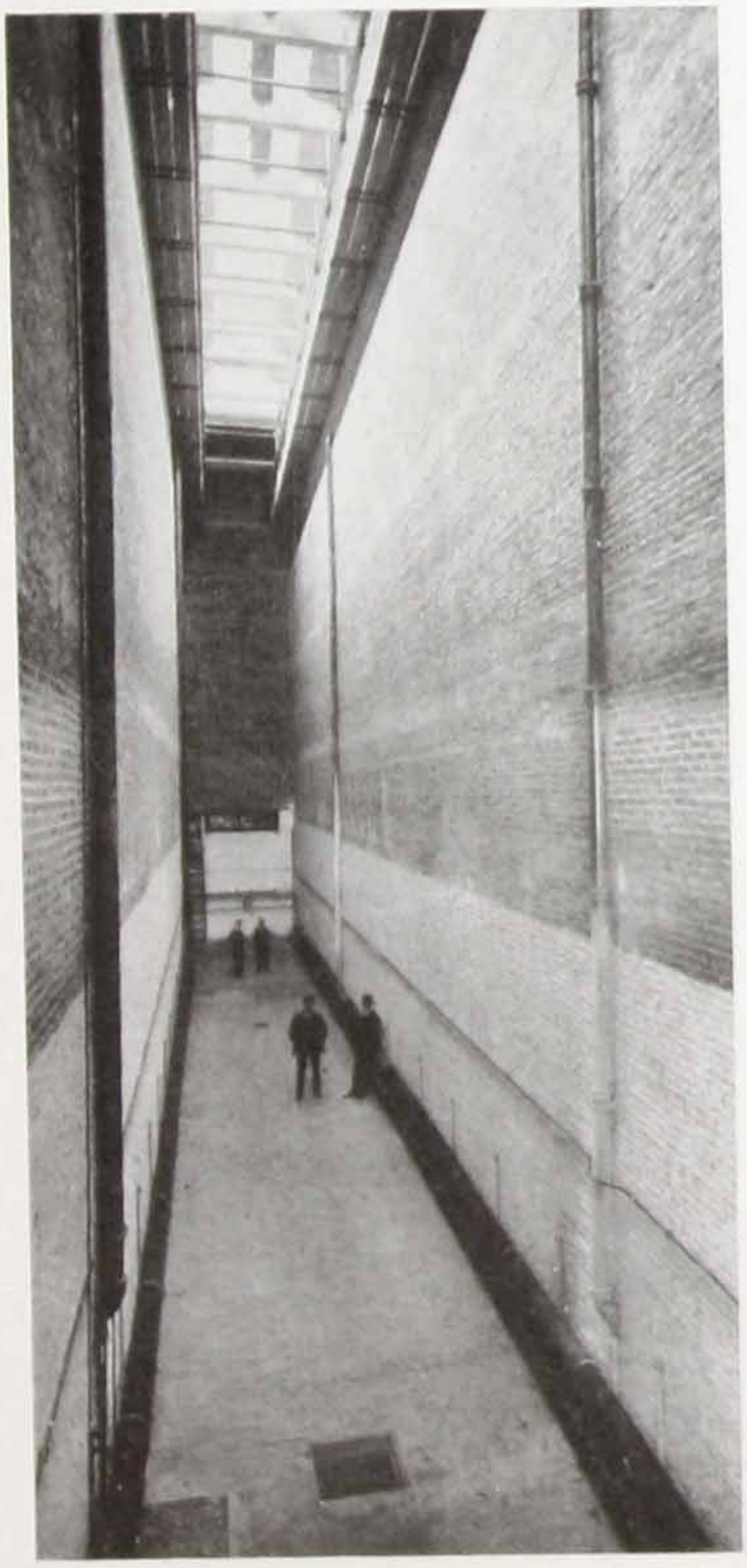
it's so big, can be adjusted for variations as fine as 1-1000 of an inch. The distance the rollers are left apart, of course, determines the thickness of the linoleum."

"Is all linoleum made this way?" interrupted one of the salesmen.

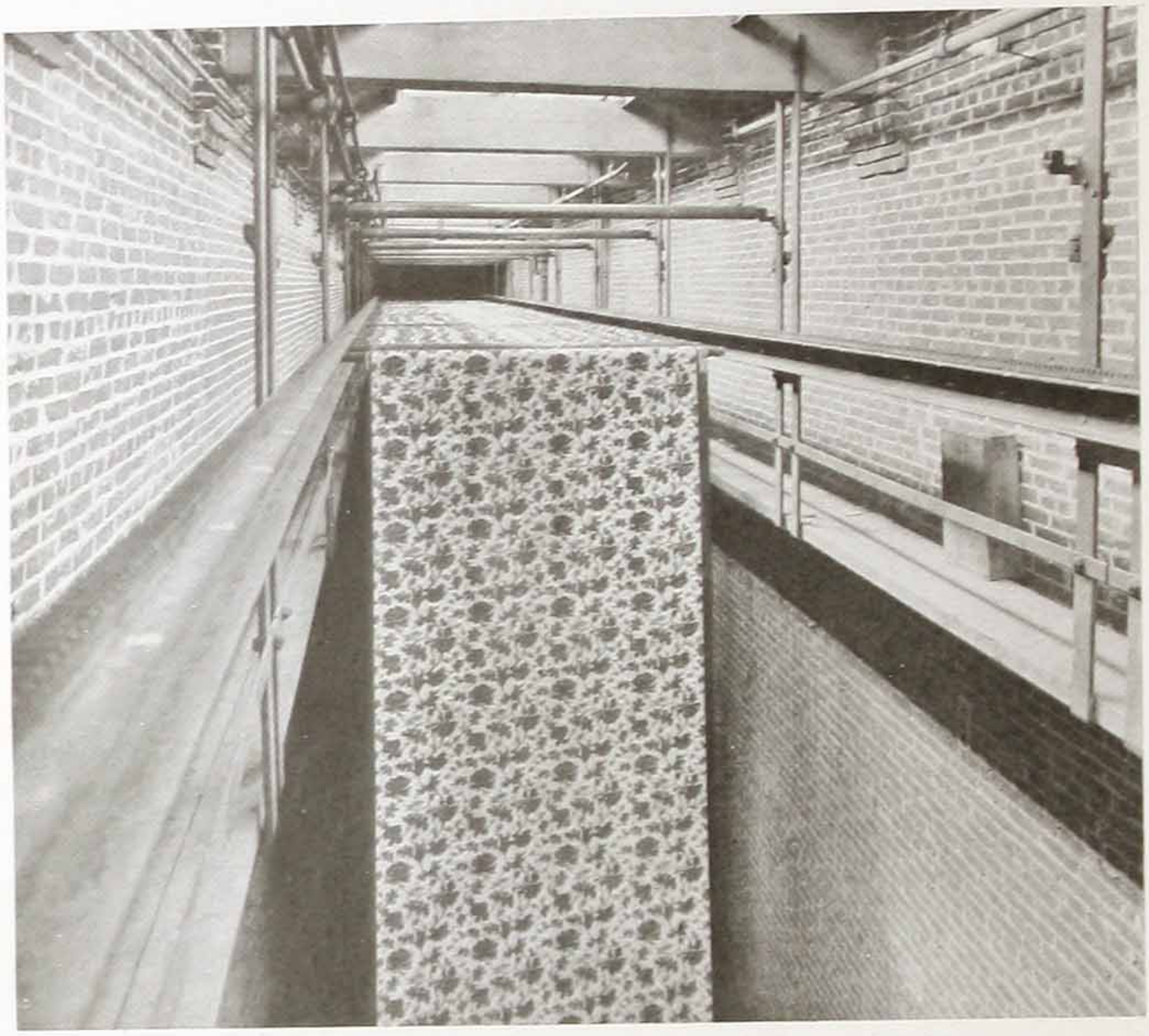
"Not exactly," the buyer replied. "Maybe I forgot to say that this process is for the plain and printed linoleums. I'll tell you about inlaids in a minute.

"Well, to go on, the linoleum goes from the calenders into 'stoves' as the superintendent called them, and when I got in there, I knew why he said 'stoves.' I wasn't there but a minute, but at that, I nearly baked.

"These stoves are big brick drying rooms for seasoning



An Empty Stove—Big brick drying rooms for seasoning the linoleum



In the Top of a Partly Filled Stove—Miles of linoleum hung up in loops to dry

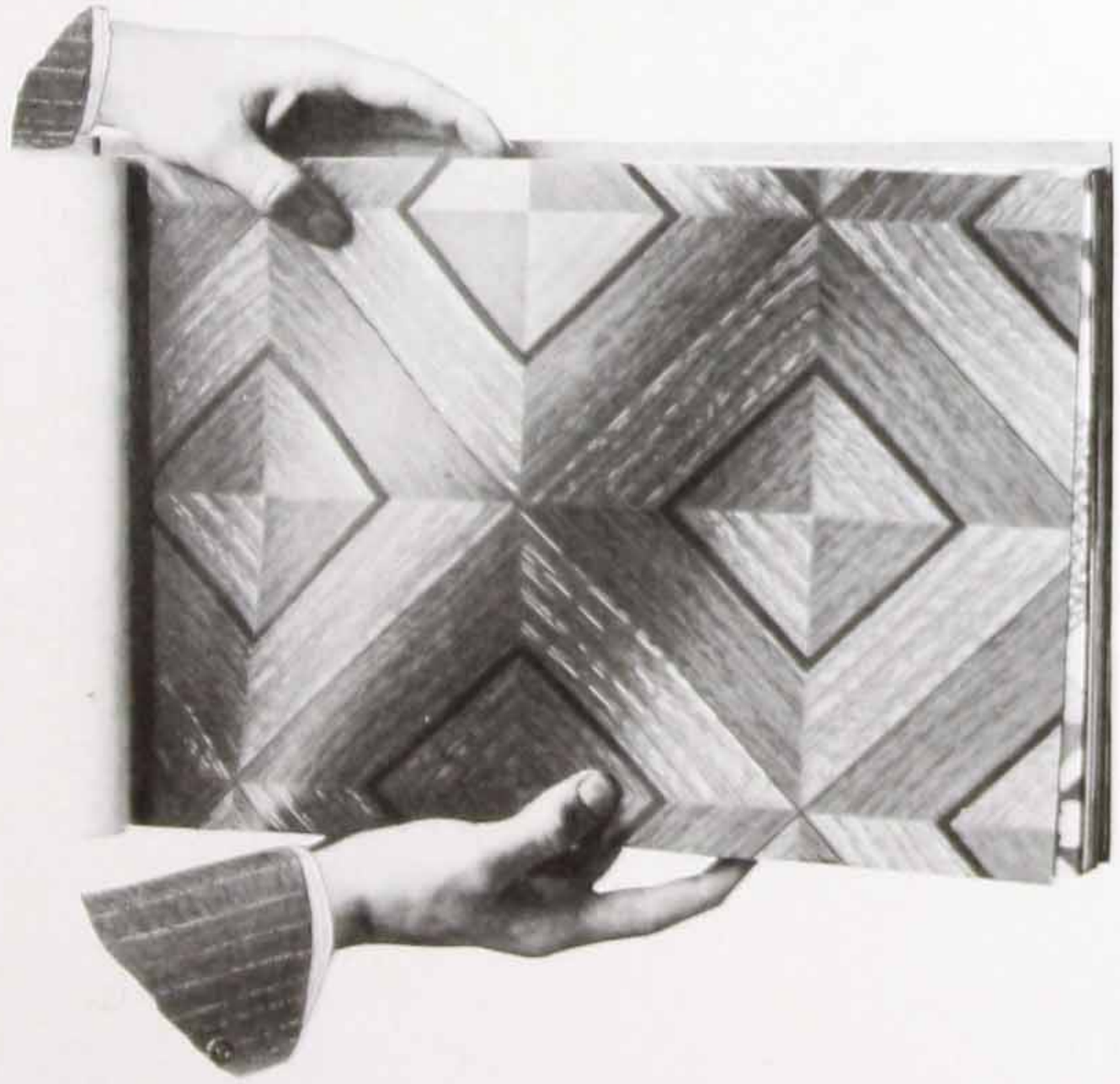
the linoleum. They're very long and narrow and I guess they must be fully sixty-five feet high. I forgot to ask how many there were—I got so interested when I looked into one that was being filled. It certainly was an impressive sight—literally miles of linoleum being hung up to dry in big loops, reaching from the top almost to the bottom. I couldn't help wondering where in the world it all went to.

"Well, after the linoleum's seasoned three or four days, it's drawn out of the opposite end

of the stoves to the printing machine. But before we go on with the printing, I want to tell you how the patterns and colors are made. Take this floral pattern here," pointing to a sample of linoleum in the sample book on his desk. "Don't those flowers look natural? There are probably ten or twelve different colors there."

"Isn't it a lot of trouble to print in so many colors?" asked one.

"Certainly it is," replied Mr. Howe, "but see how accurate the shading is. They couldn't get that effect in any other way. And this wood pattern. See how carefully the graining



And this wood pattern—see how carefully the graining is carried out

is carried out, and don't these carpet patterns too, look like the real thing?

"You know I buy Armstrong's a good deal on account of their patterns and colors. For in regard to those two points they certainly are in a class by themselves, and after I'd looked around their pattern shops I knew why. You know there are a good many things that we imagine just happen, when as a matter

Block Cutter at Work

of fact, they're all carefully planned. I wish you boys could see how much work these designs represent.

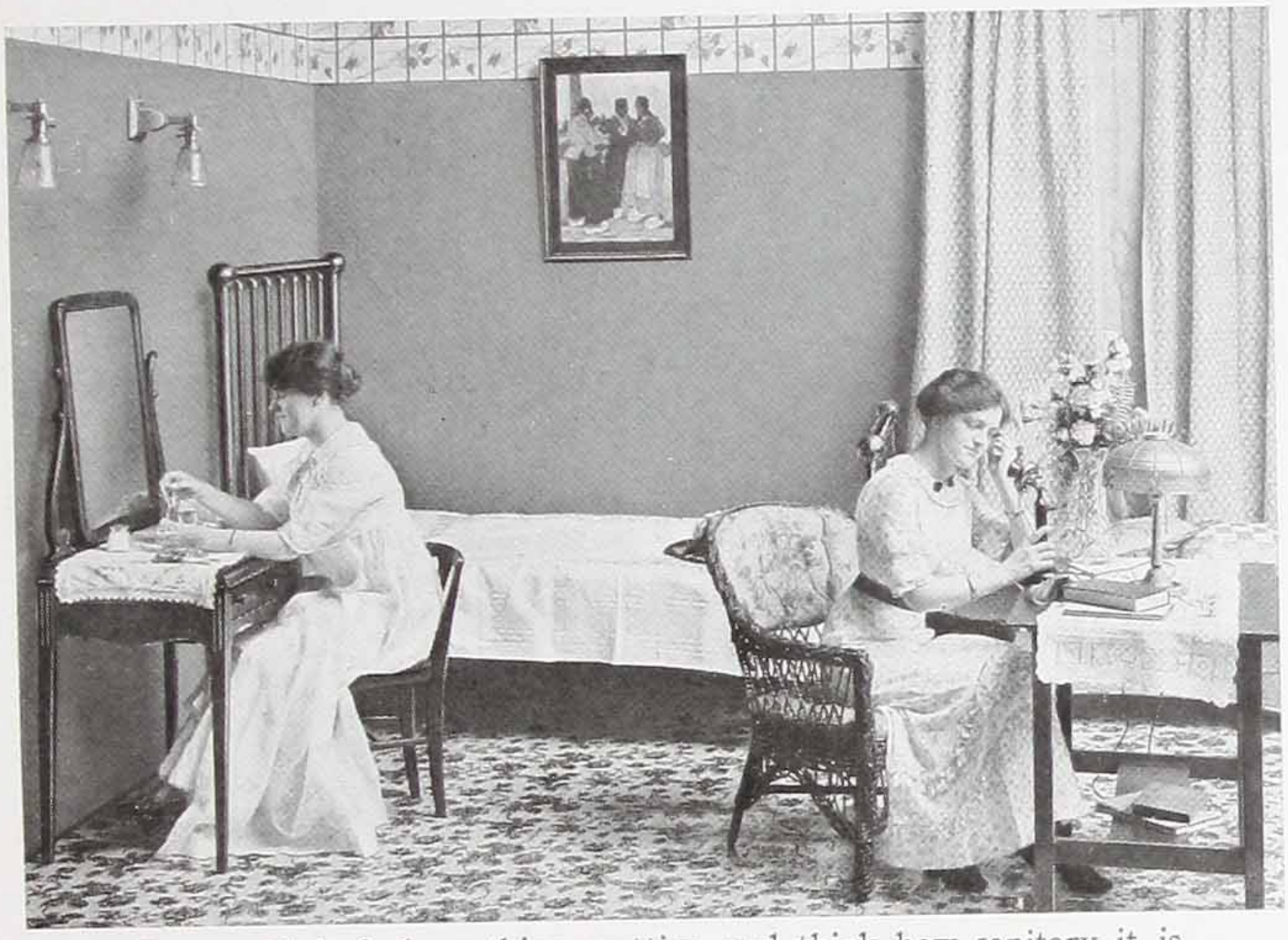
"First they're all drawn on paper and the ones that look best are selected. These are handed over to the block cutters who transfer them onto specially made blocks. These blocks are made of four layers of wood, each with the grain in a different direction, to prevent warping or twisting, and are about eighteen inches square and two inches thick. The face of the blocks is channeled, leaving strips about one-sixteenth of an inch apart. The parts of the pattern to show in the design are colored, and the remainder of the strips cut away. Or, if it's made up of diagonal lines, as in some wood patterns, the design is often traced on a plain surface block and strips of brass are hammered in. For putting in outlines, cuts similar to those used in newspapers are made out of metal and tacked on the wood blocks.

"The channeled blocks, you know, are for printing solid masses of color, or heavy lines. When it comes to outlining, metal has to be used. Take this pattern, for instance," showing another design. "It would be nothing but a series of daubs if it weren't for the fine lines.

In Europe, they use linoleum all over the house

"Of course, each color in the pattern has to have a different block and you'd naturally think they'd want to use as few colors as possible so as to save on the cost of the blocks. But the Armstrong people don't consider cost here. They're after attractive designs, and the designer isn't limited to six or seven blocks. He can use as many as he wants to and that's why the patterns really are better and more attractive. It pays to be liberal in such things. As I said before, some of their patterns have ten or twelve colors in them.

"And that reminds me: One thing that surprised me when I was abroad last summer



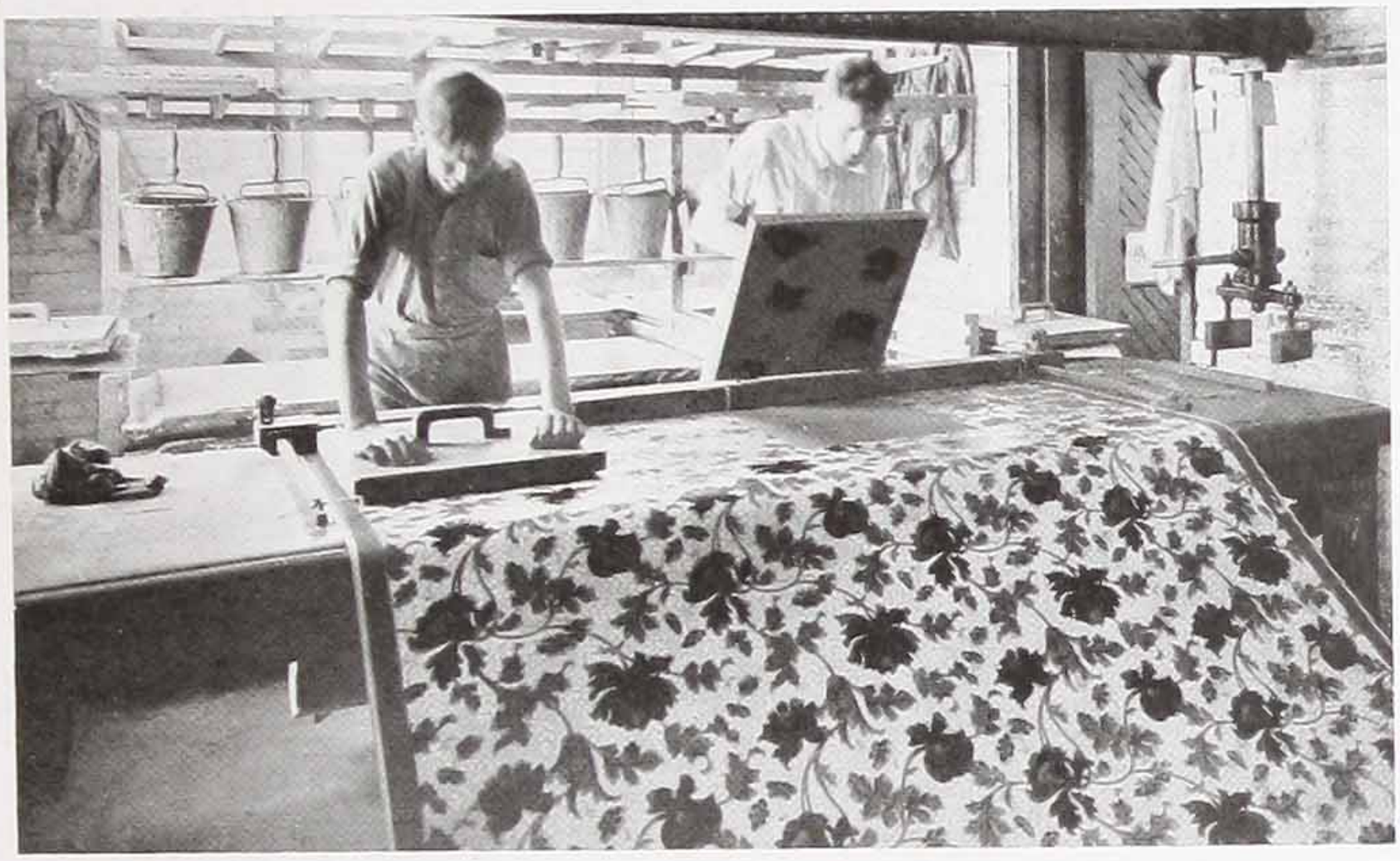
You couldn't find anything prettier, and think how sanitary it is

was the way the people use linoleum in Europe. Why, they put it in their bedrooms, in their dining rooms, living rooms, nurseries, laundries —in fact all over their houses. And I found it in school rooms, clubs, railway stations, steamer cabins and all sorts of places that we'd never think of putting it. Like all Americans, I was prejudiced against the idea of using linoleum in—say bedrooms, but when I saw some fixed up with dainty matting patterns or simple floral or carpet designs—with a rug or two thrown on top—I changed my opinion mighty quick. I tell you, you couldn't find anything prettier, and just think how sanitary it is,

compared with an old wood floor with a lot of cracks for dust and germs to get into.

"Now, what made me think of that right here was that the Armstrong people told me that one reason they were adding so many new and unusual patterns to their line was to help create just such a demand for linoleum in this country. Personally, I feel it's bound to come sooner or later. I talked to a buyer from down East the other day and he said he was selling a lot of linoleum for bedrooms and living rooms by simply suggesting it to people who were figuring on using matting or some other cheap floor covering. I've just been thinking—why can't we do the same thing and boost our sales?

The blocks used on the printing machines are about six feet long



Forty to a hundred different color combinations of each design are made up by hand-printing

"But, let me see, I've gotten clear off the track. Where was I?"

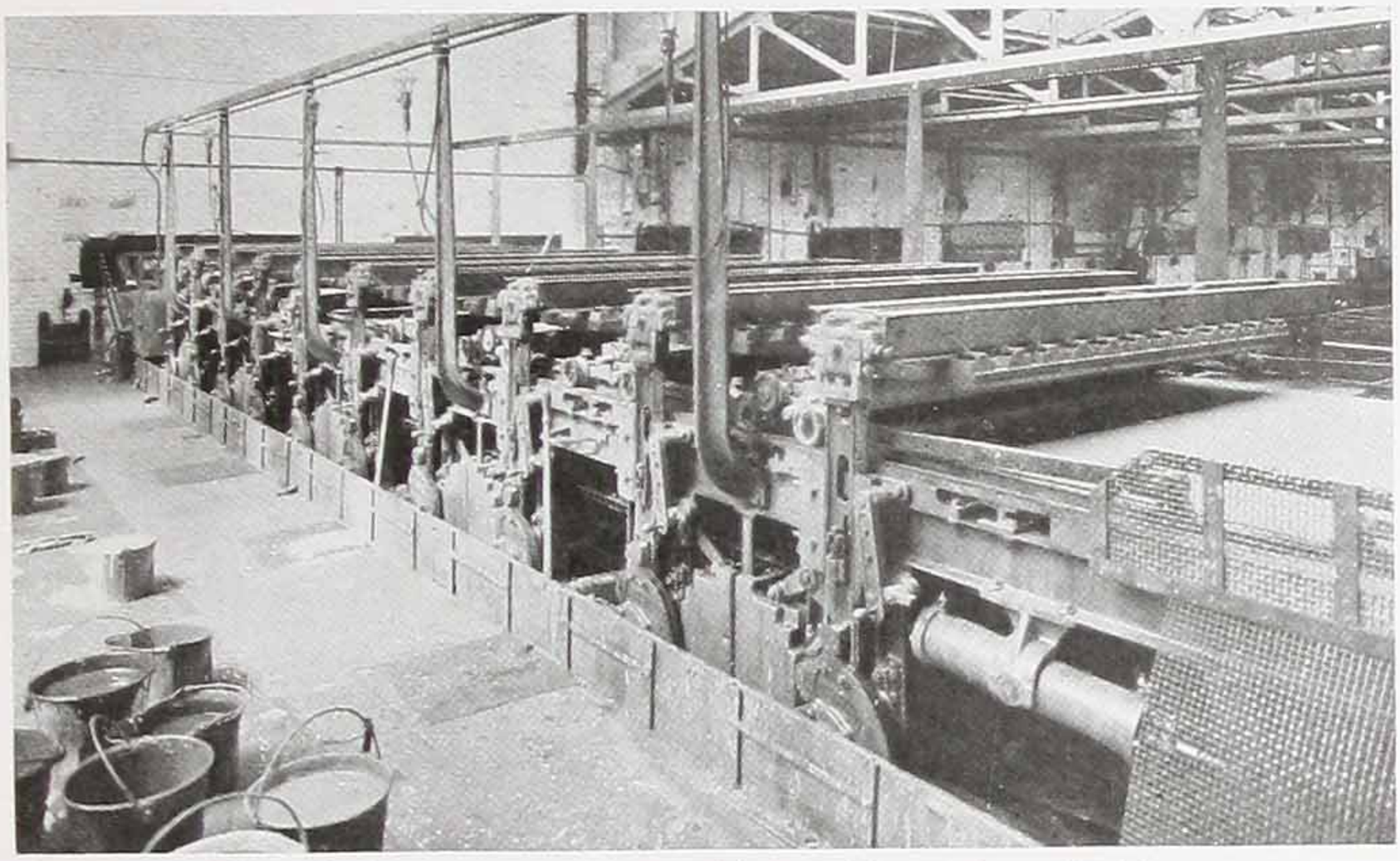
"You were talking about the printing blocks," said one of the salesmen. "Do they print all the linoleum with those 18-inch ones you spoke of?"

"No—not from them," replied the buyer. "The blocks used on the printing machines are bigger—about six feet long—and are duplicates of these first blocks. They use these small blocks first for testing out color combinations. They make up forty to a hundred different color combinations in each design by hand printing. Each block is in turn pressed on a bed of paint of the proper color and then stamped on paper. They make these paper samples," pointing to one on his desk, "the same way.

"When these various color combinations are finished, they're gone over carefully and three or four selected from the lot and the rest rejected, and I tell you some of those rejected ones were beauties. Still, it's a case of 'survival of the fittest,' and whenever you see a pattern in Armstrong's, you can just think that it's probably one of the two or three best color combinations out of a hundred.

"When it comes to mixing the colors for the printing, there's no guess work. First they're tested to see that they're up to standard, and you can be sure that color makers who know how rigid the test is, won't take the chance of sending poor materials. Of course, the colors come in powdered form, but to be doubly sure, the Armstrong people grind them over several times.

In mixing the colors for printing there's no guess work

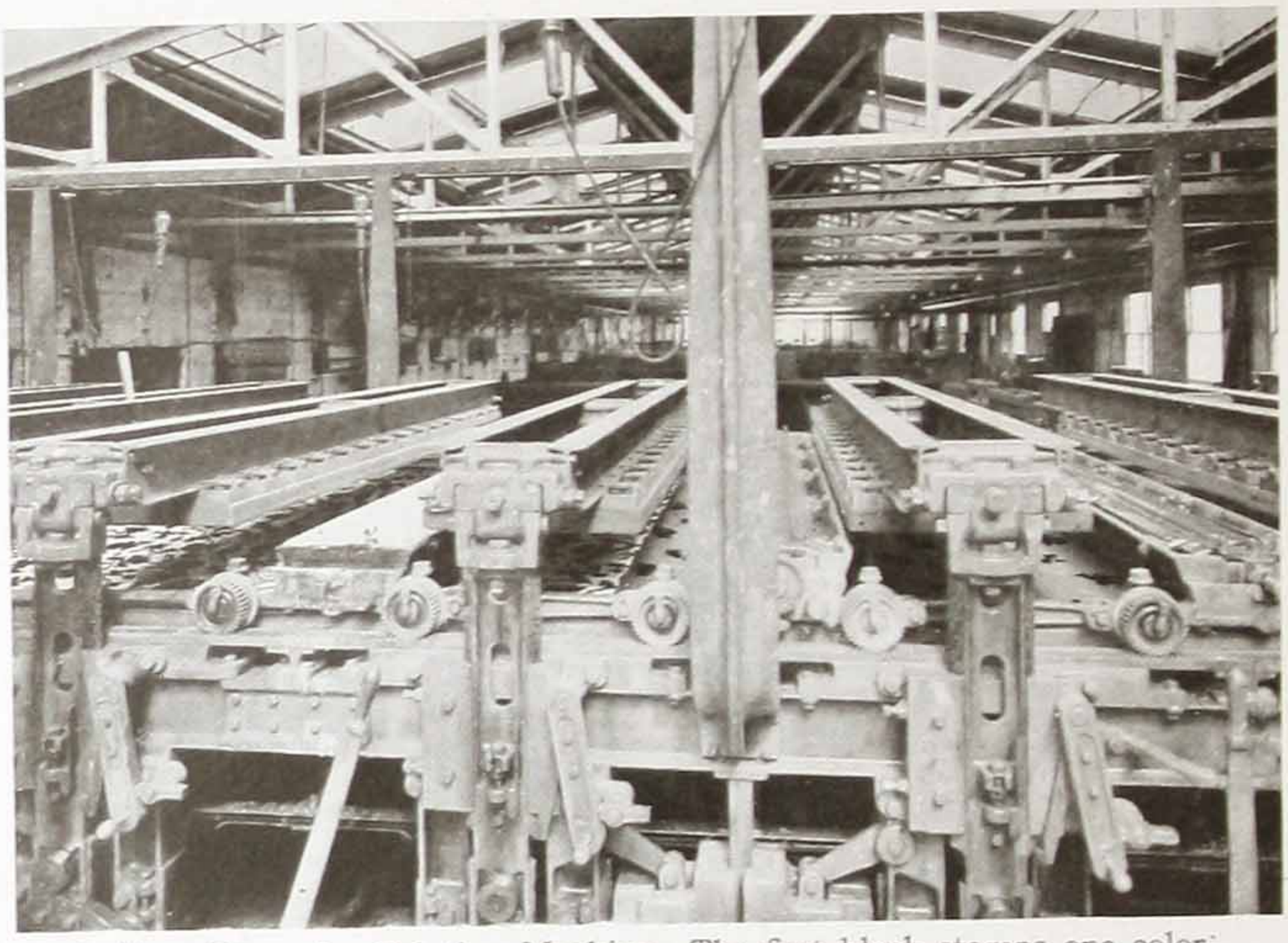


The printing presses are great big machines—forty feet long

"Then, every ingredient that goes into the paint is carefully weighed according to an exact formula, and the mix matched up with the shade desired and O. K.'d by the designer before any of it's used. You can be sure when you re-order that you're going to get exactly the same shades as you had before and that the new stuff 'll match up perfectly with what's left in stock.

"I tell you, Armstrong's don't leave many loop-holes for mistakes. I wish you could see how much care they take with their colors and how they boil and treat all the oil used in the paints. It was a revelation to me. No wonder the finish on their goods wears so well and has so much lustre.

"But that's enough about colors for the present. Let's get back to the printing. The printing presses are great big machines—



A Close View of a Printing Machine—The first block stamps one color, the next one another and so on

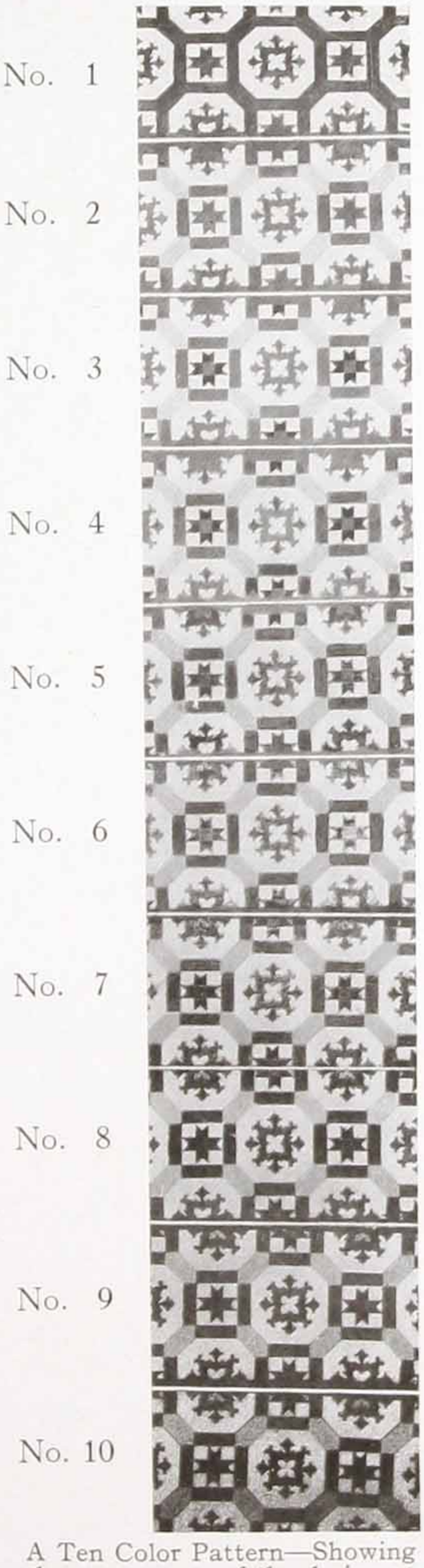
forty feet long or so—but instead of being stationary, are on tracks so they can be moved from in front of one stove to another. The linoleum comes out of the stove over a roller, passes under the press, and, before it reaches the printing bed at the opposite end from the stove, is carefully brushed so as to remove any dust on the surface that might spoil the printing.

"The blocks, face down, are automatically coated with the paint and then stamped on the linoleum. The first block stamps one color, the next one another, and so on. It's fascinating to watch the change with each different color—almost as interesting as a moving

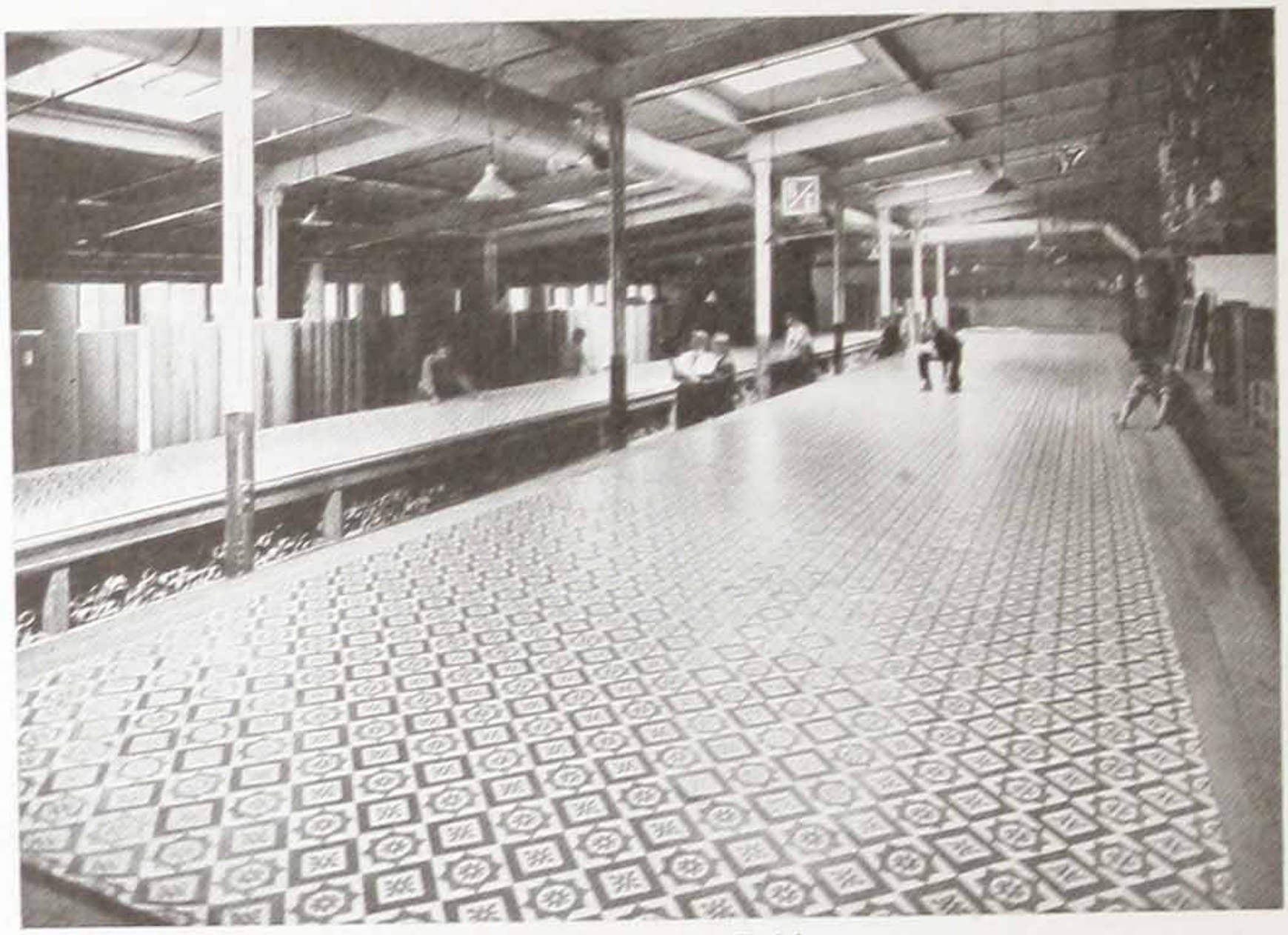
picture show. As the linoleum's printed, the press feeds it back into the stove, where it dries for three or four days more.

"Then it goes to the trimming machine where knives on each side trim off the selvedge. As this is being done, the linoleum is inspected for flaws, measured automatically, and then cut off into rolls of sixty square yards as we see it here in the store.

"But that isn't all. As a last precaution they put it on the inspection tables for a final examination. These tables are long enough and wide enough to accommodate a whole roll at a time. The stuff's care-



A Ten Color Pattern—Showing the appearance of the design at each step in the printing process



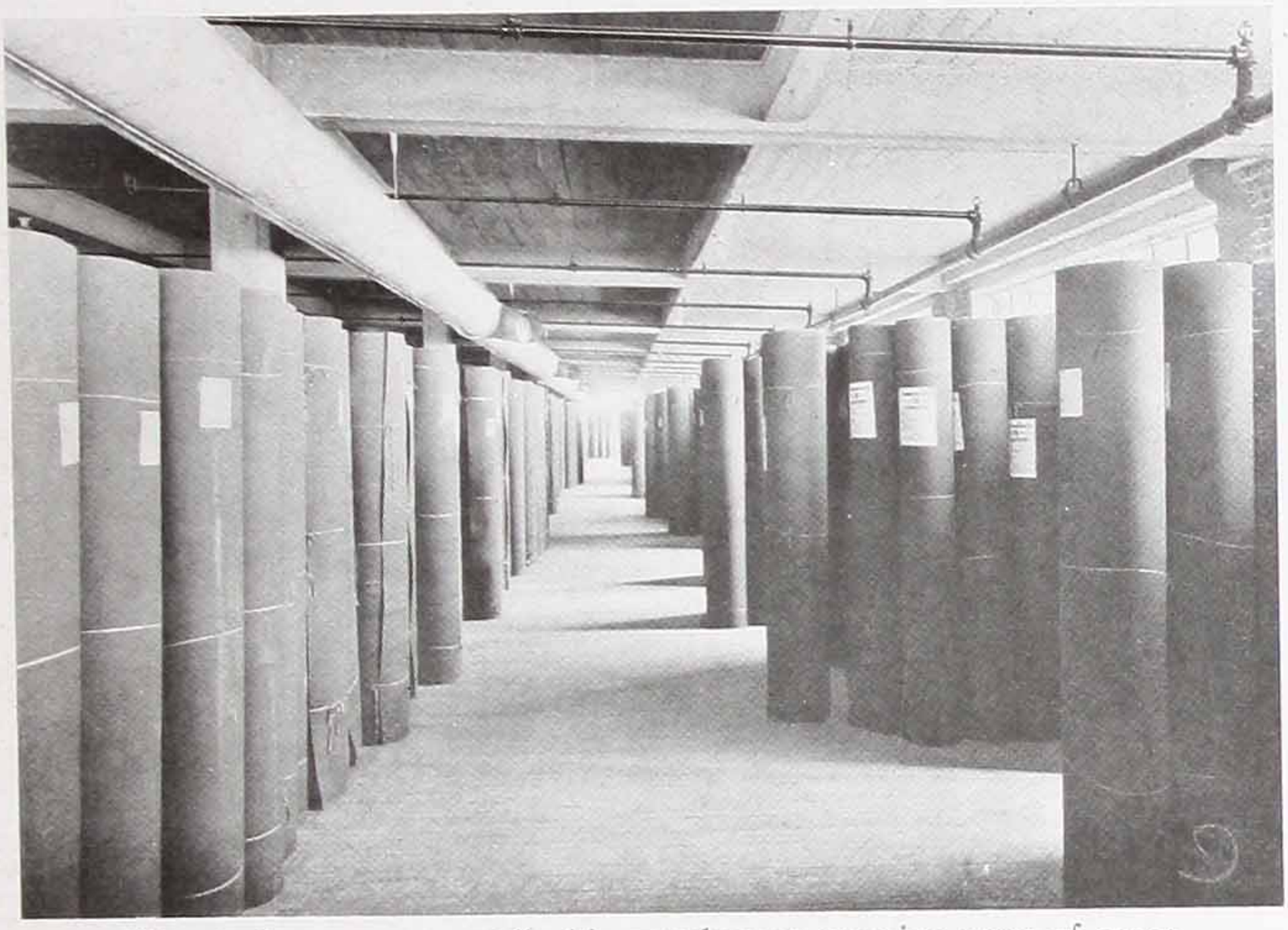
The Inspection Tables

fully looked over here under bright daylight, and if all right is re-rolled and sent to the stock room."

"That seems like a lot of trouble, inspecting things so many times," interposed one of the listeners.

"Well, it is," the buyer replied, "but it's the only way you can be sure a product's coming through right.

"Now, when I said stock room, I didn't mean a small space like we have here in the store. The stock rooms there are really big warehouses covering acres of space. On one side of them is the shipping platform with its



The stock rooms are really big warehouses covering acres of space

sidings for cars. You see, the cork, oil and other things come in at one side of the plant, and the finished linoleum goes out at the other side. There's a continuous stream through the mill—with no lost motion anywhere.

"The plant's only seven years old and the buildings and machines are placed just right so there won't be any backward steps. Saving time in this way and having up-to-date machinery make it possible to produce better linoleum without charging any more for it. Now, I hope I'm not tiring you but there are one or two things more I ought to mention."

A medley of replies came from half a dozen. "Go on, Mr. Howe." "We're in no hurry." "Tell us some more."

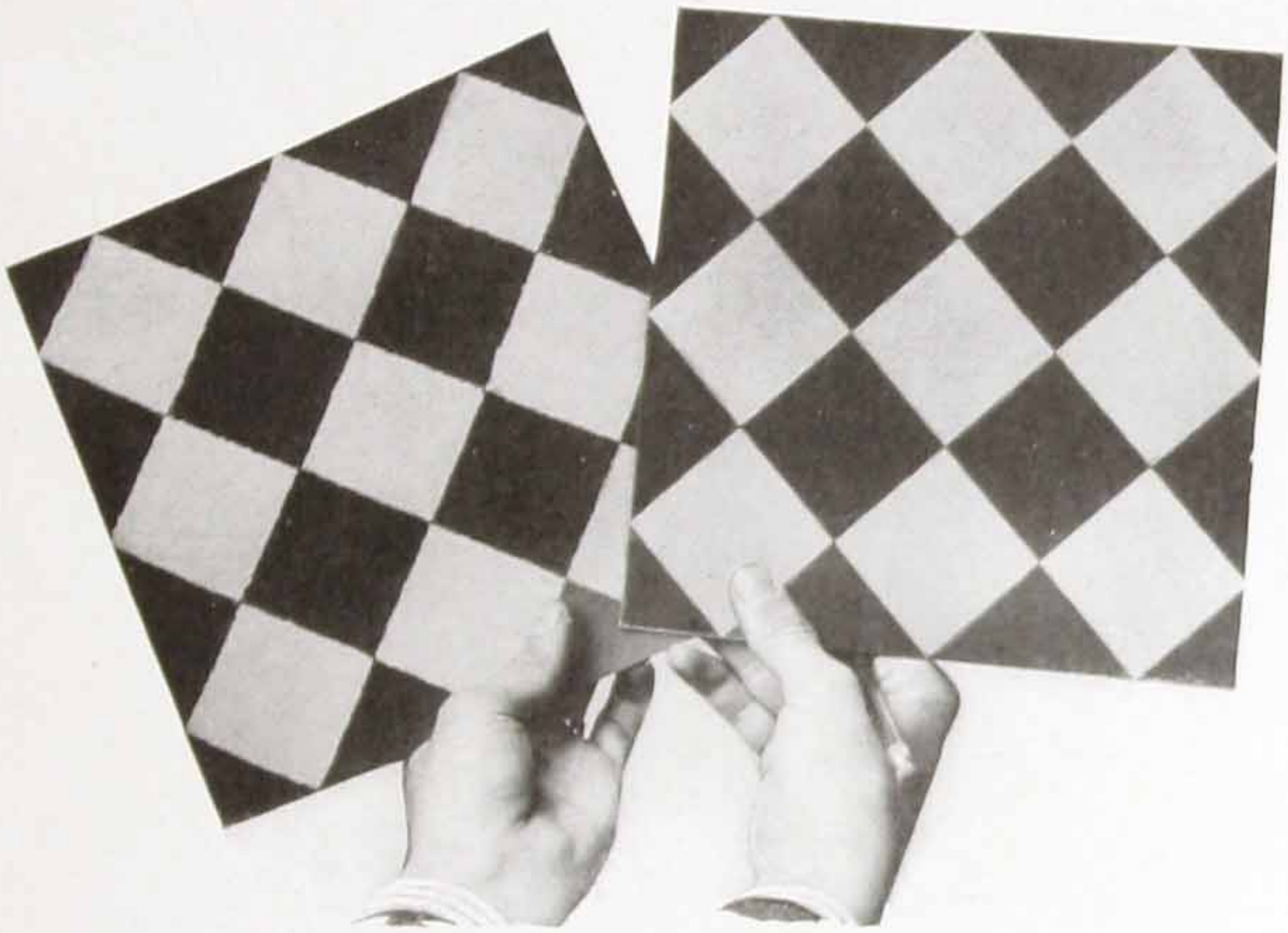
"Well, I will," rejoined the buyer, "but don't blame me if you're scolded for being late to dinner.

"What I've said so far is about plain and printed linoleums. Now we'll take up inlaids. Linoleums to be printed are always either dark brown or green. Inlaids may have a half dozen or more colors, and each color has to be mixed separately.

"For 'straight line' inlaid the process is just the same as for printed linoleums till it gets to the calendering machine. But instead of being pressed into the burlap there, each color is rolled out separately into sheets like biscuit dough."

"There are two general ways of making inlaids, aren't there, Mr. Howe?" interrupted one of the salesmen.

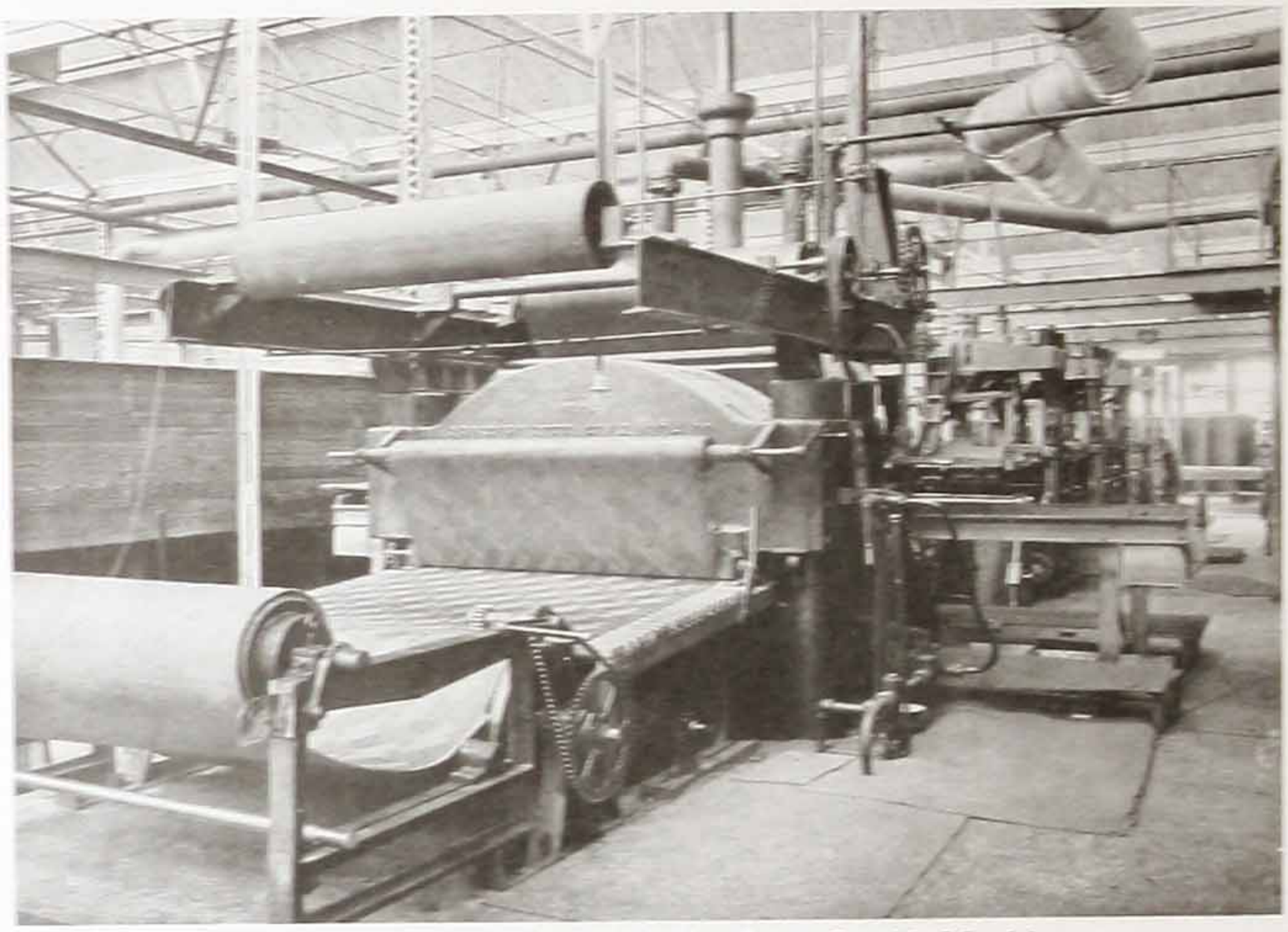
The raw materials come in on one side of the plant and the finished linoleum goes out on the other side—no lost motion anywhere



This one is granulated inlaid and this one is straight line inlaid

"Yes," replied the buyer. Holding up two samples, he went on. "This one," pointing to one of them, "is granulated inlaid. Notice how the edges of the different figures are sort of irregular. When I explain further you'll understand why. This one," referring to the other sample, "is 'straight line.' Do you see how straight the outlines of the blocks of the different colors are?

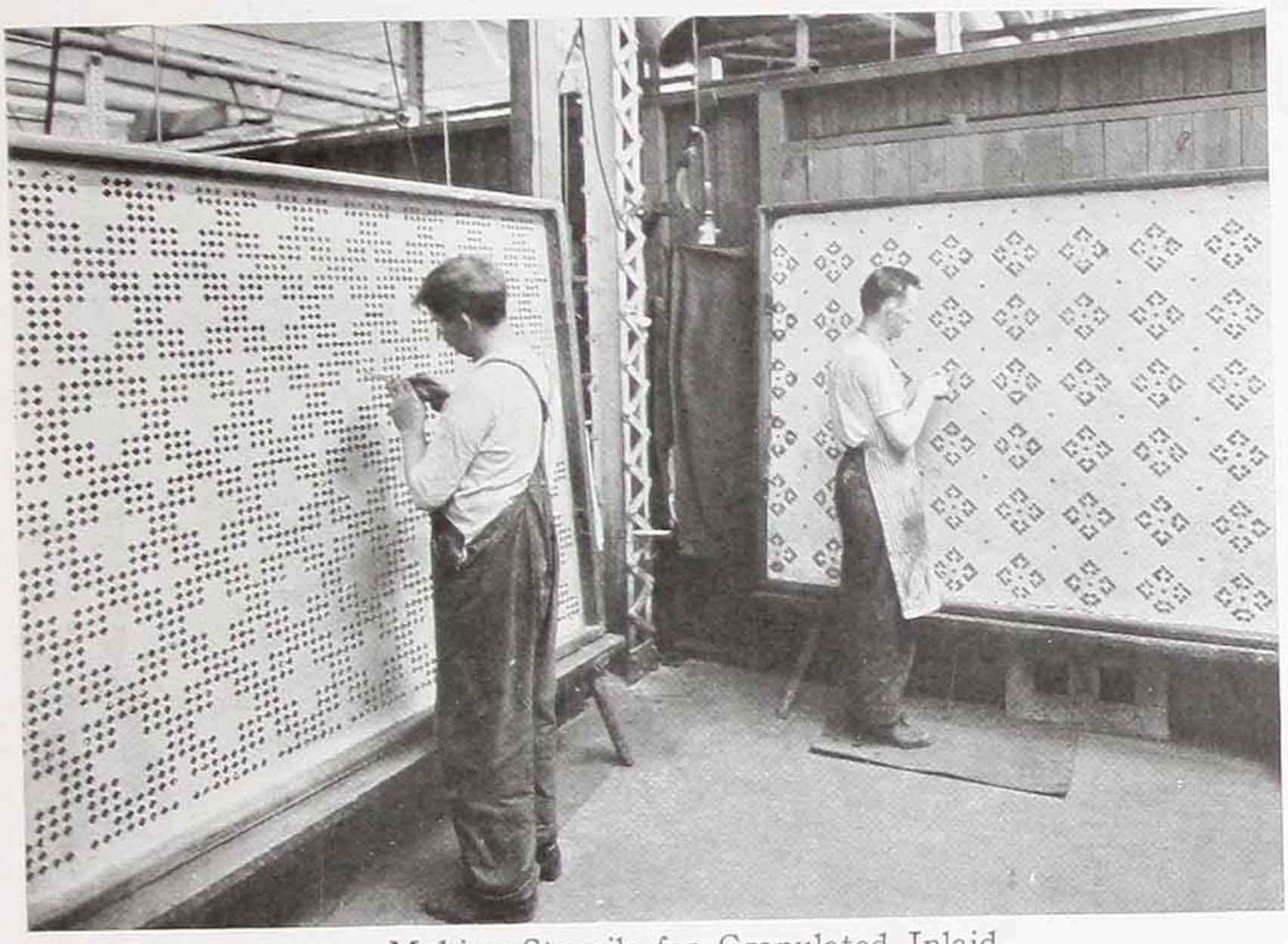
"Well, to get back to where we were. After the 'mix' is rolled out into sheets, the pieces for 'straight line' linoleum are stamped out mechanically in the right shapes and placed where they belong on the burlap, to make the



The Press End of the Straight Line Inlaid Machine

pattern. Then these pieces and the burlap are forced together under heat at a pressure of twelve hundred pounds to the square inch. Practically all this is done automatically. The steel dies for a single pattern cost thousands of dollars. That's one reason 'straight line' inlaid's expensive stuff.

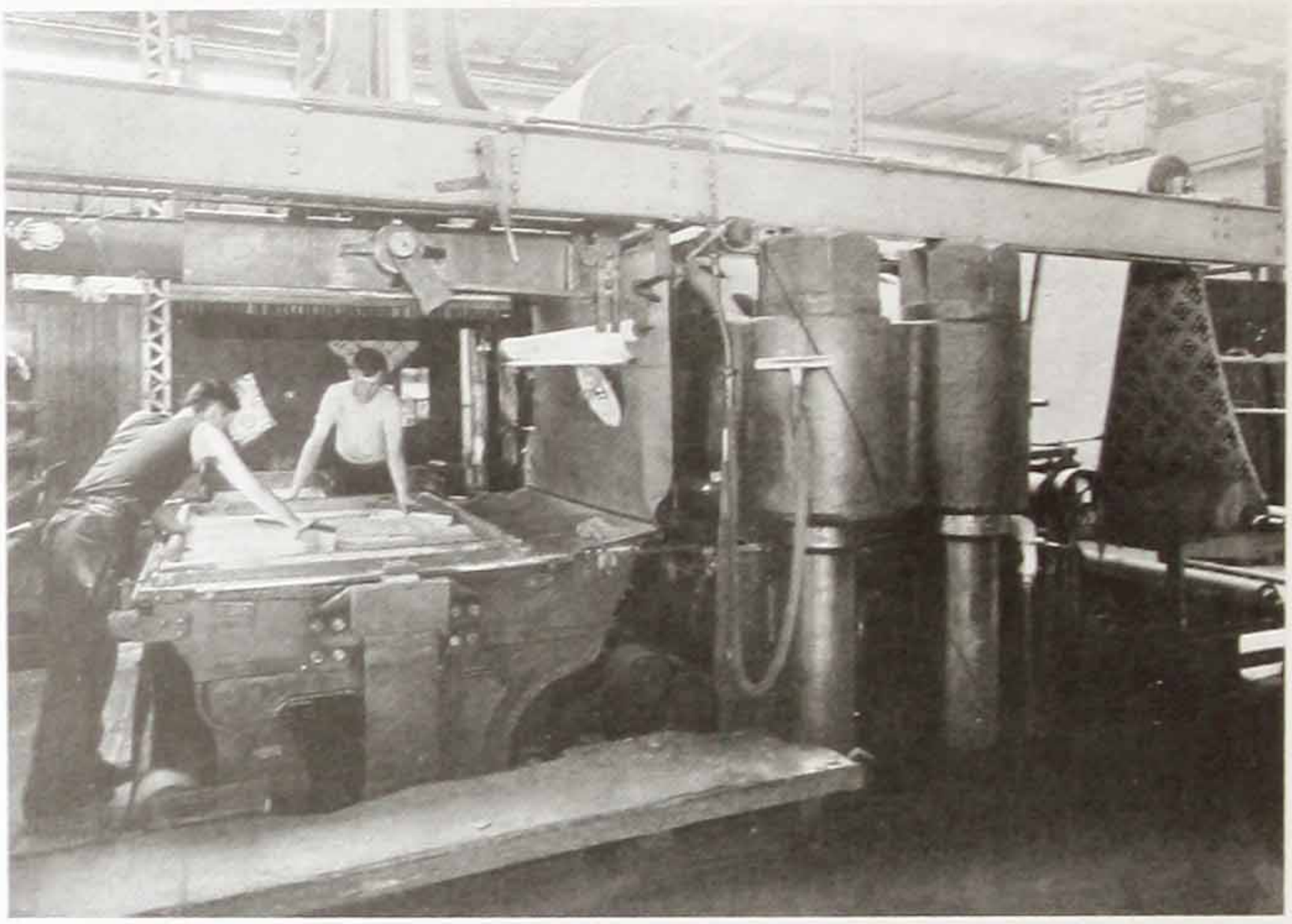
"Now, take the granulated or mottled inlaid. It's made in an entirely different manner. Instead of being rolled into sheets the 'mix' is pulverized. Then it's thoroughly cooled, so that it won't stick together and clog the stencils. Next, it's carefully sieved to take out all lumps, and finally it's conveyed to the inlaying machine.



Making Stencils for Granulated Inlaid

"This machine consists of a big press and a number of metal stencils—one for each color of the pattern that's being made. The stencils are two yards wide—just the width of inlaid linoleum—and about five feet the other way. The holes in them are cut so as to correspond with the figures in the pattern. The work of cutting and filing the stencils is done largely by hand, and it keeps a lot of men busy preparing them.

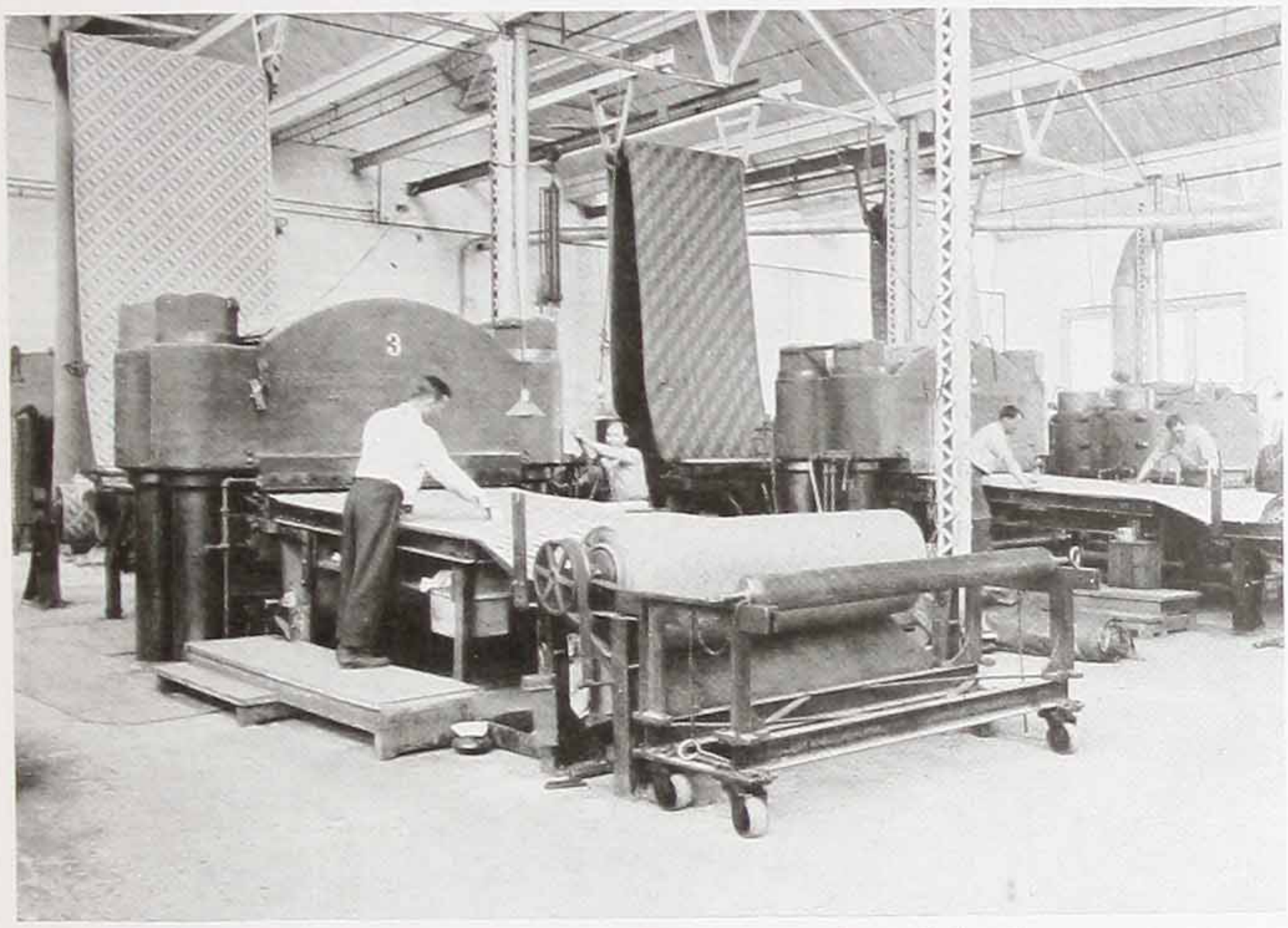
"Now, suppose a four-color pattern is being made on the machine. The bed is covered with oiled paper, which comes in from a roll at one end. The men put the first stencil on,



The Granulated Inlaid Machine—A stencil may be seen in place at the left and the finished linoleum at the right

say, for the red parts of the pattern. Then scoopfuls of red granulated mixture are thrown on the stencil, and any surplus that doesn't go through the holes is scraped off.

"Then, this stencil is taken off and the next stencil, say, the one for the green color, is put in its place. The same thing is repeated for the other colors until the pattern is completely worked out—the oiled paper being entirely covered. Then the burlap backing which comes from a roll above the machine, is laid over the top and the loose mixture, burlap and paper —altogether—are subjected to heat and pressure of over half a ton to the square inch. After-



The Finishing Presses—Which smooth and harden the surface of the inlaid linoleum

wards, of course, the paper is easily peeled off the surface. The pressing naturally forces some of the colors over into the others. So the lines of the different figures are not as clean cut as in the 'straight line' goods.

"Before the inlaid is placed in the stoves to season, it's passed through the finishing presses that smooth and harden the surface. Then as it enters the stoves, the back is coated with red paint which acts as a preservative for the burlap. And do you know, the inlaid has to stay in the stoves anywhere from two to six weeks, depending on the thickness? I was simply amazed when I heard that. No wonder it costs money.

"Now, let me see, have I forgotten anything?"

"Does it make any difference what kind of burlap is used?" came from one of the group of salesmen.

"Oh, yes," replied Mr. Howe. "Of course, the burlap has to be strong enough to stand the strain in going through the machines and besides, if it weren't evenly woven, it'd cause trouble by buckling. You know it all comes

Coating the Burlap Backing with Red Paint

from Scotland and there's always the danger of damage by sea water. Now, sea water rots burlap very quickly. So Armstrong's inspect every inch of the stuff they get. It's all with the same end in view as the other inspections —to turn out reliable goods. You know how careful we try to be to give people only good goods. Well, they're doing the same thing.

"By the way, here's something else I nearly forgot. When it comes to getting exactly the same colors in inlaids as they've had before, they're up against a tough proposition for this reason: Colors dry out differently. It takes an expert to tell just how much they'll change. A man has to know his business or there's liable to be a big loss in 'off' shades. But they seem to have the men who know how to do it at Lancaster. Of course, getting specialists means paying higher salaries but after all I guess it's a good plan.

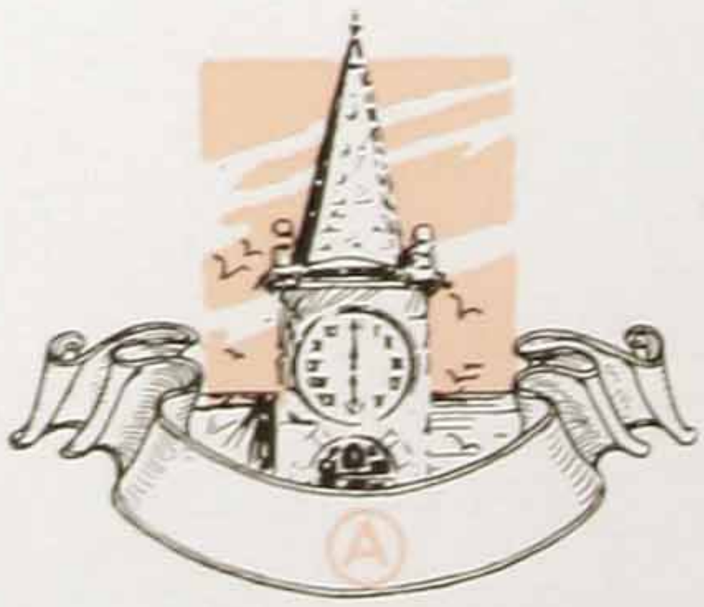
"Every other week the executives and the foremen of the different departments get together and talk over things in general. Maybe one has an idea for a new process that'll make linoleum better, or another may have in mind a new feature for some machine. Now when you get thirty-five experienced men thinking along the same lines and then get these men

together to exchange ideas and improve on them, something's going to happen. And this spirit of co-operation isn't confined to the foremen. There's good fellowship all through the ranks. It's the sort of spirit that makes the men careful. And a little extra care, you know, is what raises the quality of any article above the ordinary level.

"Maybe I've mentioned a point or two that would interest your customers. If I have, use them. Everyone likes to be waited on by a man who knows his goods. And here's some additional material," pointing to some printed matter, "that you can look over when you get time, if you want to. If you forget anything, ask me about it. I tell you that trip to Lancaster certainly filled me full of linoleum enthusiasm."

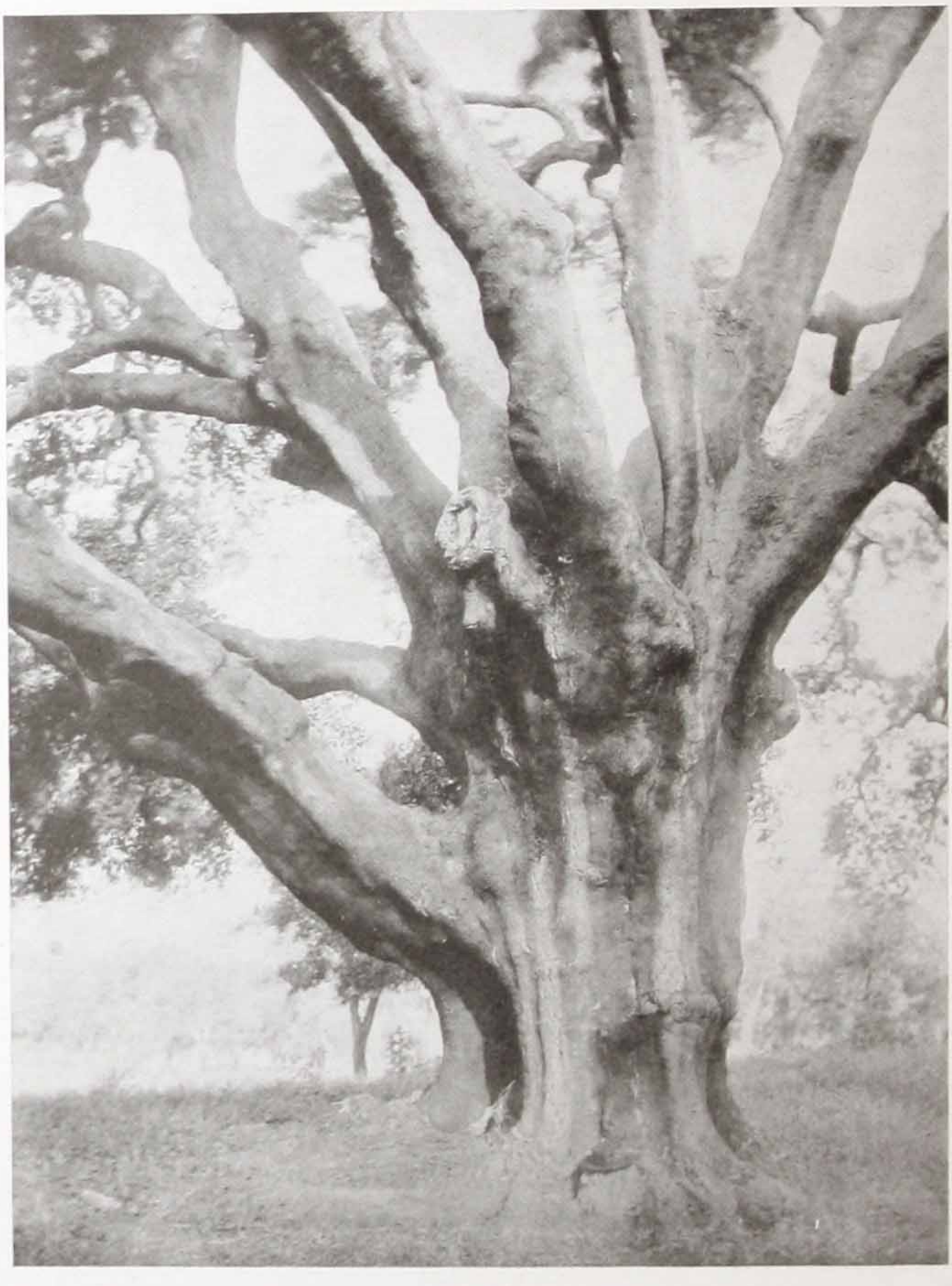
The clock in the steeple struck six.

"Good-night boys," Mr. Howe was saying, as he grabbed his hat, "I never talked so long at one time in my life."



Mr. HOWE'S Printed Matter

SOME OF THE INTERESTING INFORMATION REGARDING CORK, LINSEED OIL, BURLAP, KAURI GUM AND COLORS, WHICH MR. HOWE COLLECTED FOR HIS SALESMEN, IS PRINTED FOR YOUR CONVENIENCE ON THE FOLLOWING PAGES



The heavy Coating of Cork is Removed every Eight or Nine Years

Cork

For more than twenty centuries the cork oak has given up its protecting outer bark for the use of mankind. The ancient Romans utilized it for stoppers, buoys, seine floats, insoles and life preservers, but with the passage of time, its field of service has been further enlarged. Today it is found furnishing cores for base balls and paving brick for horse and cow stalls; carburetor floats for automobiles and tips for cigarettes; insulation for cold storage plants and tiling for museums and libraries; covering for cold pipes and sound-deadening for noisy machinery, besides being one of the most important ingredients of linoleum and appearing in a host of other forms too numerous to mention.

Cork is the outer bark of the cork oak, a tree that flourishes in the Spanish Peninsula, Southern France, and Northern Africa. Of the various countries, Portugal is the leader in cork production, Spain is a close second and Algeria ranks third. The heavy coating of outer bark is removed after eight or nine years. So long as the delicate inner skin is not harmed, this process seems to further rather than retard the growth of the tree.

The stripping, which is done during the summer months, is a simple process. The workmen cut through the outer bark carefully, following the deepest of the natural indentations, and then pry it off in large sections by inserting the long wedge-shaped handles of their hatchets. Not only the trunks, but the larger branches are stripped—the latter yielding the better bark. Care must be taken not to injure the inner skin of the tree at any stage of this process, for the life of the tree depends

on its preservation. If it is injured at any point, growth there ceases, and the spot remains scarred and uncovered.

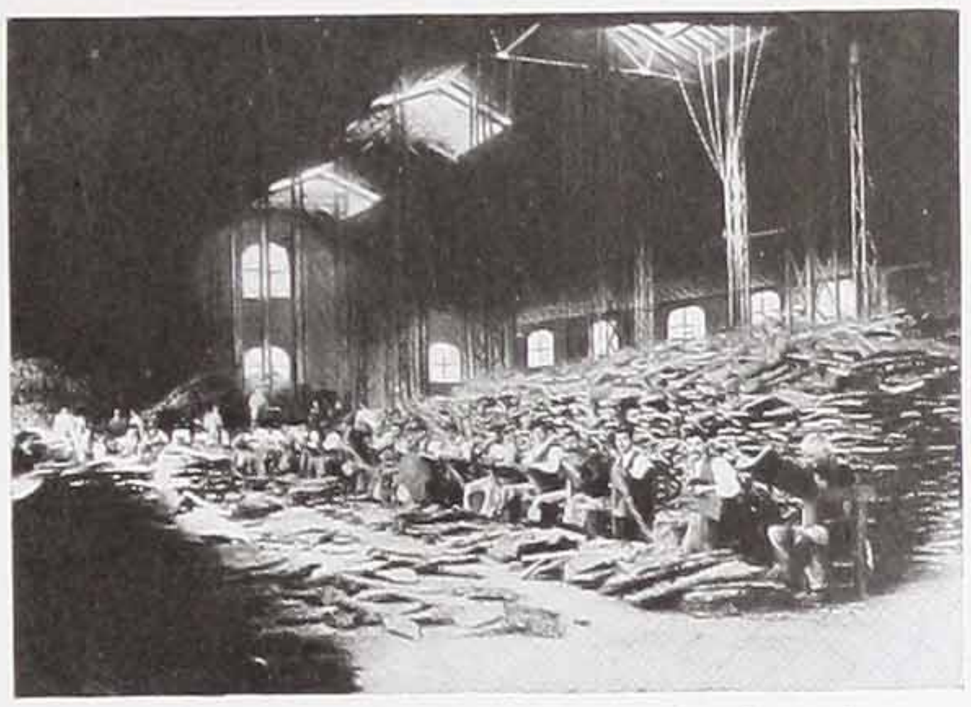
The trees are stripped as a rule, for the first time when they have attained a diameter of about five inches, which they usually do by the time they are twenty-five years old. The first stripping is known as "Virgin" cork and is so rough and coarse in texture that it is of little commercial value. But the tree at once sets about forming a new coating which, at the expiration of eight or ten years, is also removed. It is known as "second-stripping" bark and usually is of fair quality, but owing to the large number of indentations, there is a great deal of waste involved in cutting it up.

But with the third stripping, which follows in about nine years, the tree begins to yield its best bark and continues productive, as a rule, for a century or more. Cork trees several hundred years old, however, are not unknown. The thickness of the bark is anywhere from a half-inch to two and a half inches and the yield also varies greatly—from fifty to five hundred pounds, depending on the size and age of the tree.

After the bark is removed from the trees it is gathered in piles in the forest and allowed to season for a few days. It is then weighed—weight being the basis of payment. Next it is roughly baled up and carried, either on the backs of burros or

Bringing Cork down from the Mountains in Spain

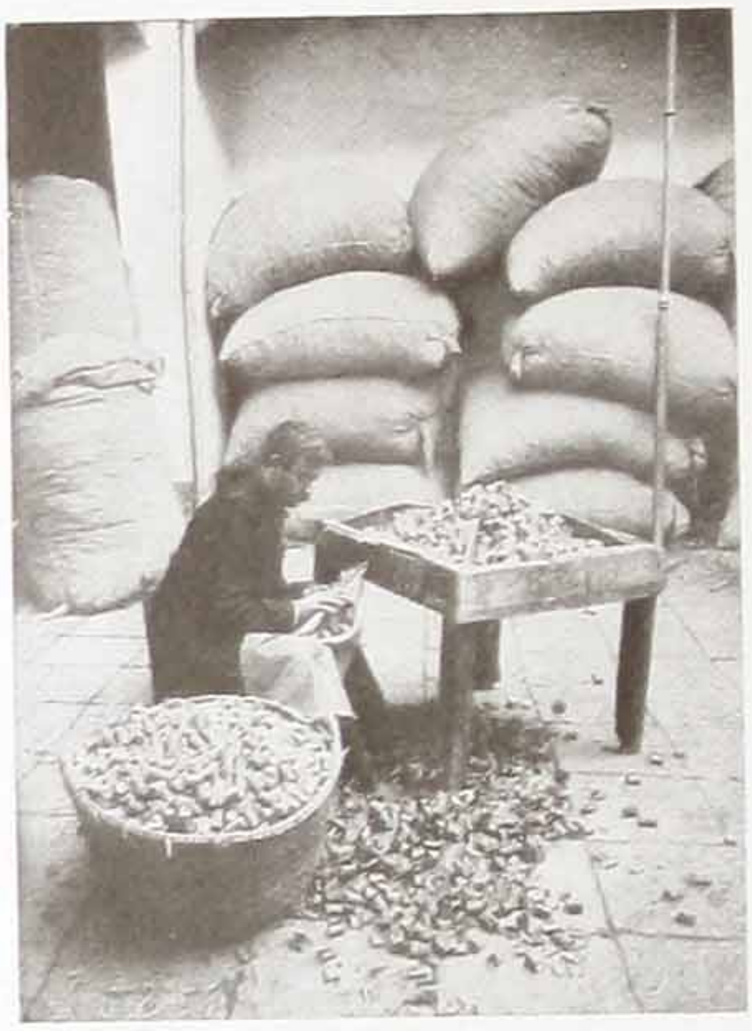
in wagons, to the nearest boiling station. Here the cork is boiled in large vats. The rough woody part can then be easily scraped off, reducing the weight of the material almost 20%. The boiling process, moreover, renders the bark soft and pliable and flattens it out for convenient packing.



Trimming Sheets of Cork in the Armstrong Factory at Seville, Spain

The cork is then conveyed to the nearest railway station for transportation to one of the foreign plants of the Armstrong Cork Company, the largest being situated at Seville, Spain. On arrival at the factory, the cork first goes to the trimmers, who cut off the rough undesirable portions. It is then sorted into a dozen or more grades according to quality and thickness. The importance of this last mentioned operation cannot be over-emphasized as the whole problem of the successful and economical manufacture of cork centres about it. The expert Spanish sorters having finished their work, the bark is re-baled for shipment to America, each bale being carefully stenciled with marks indicating grade or quality. Loaded then into ocean-going steamers, not infrequently a whole ship's cargo of cork at a time is transported to Philadelphia, New York or Baltimore and thence forwarded by rail to the main plant at Pittsburgh or to one of the other American factories of the Armstrong Company.

In the manufacture of corks, washers, insoles, life preservers and the host of specialties that are made from



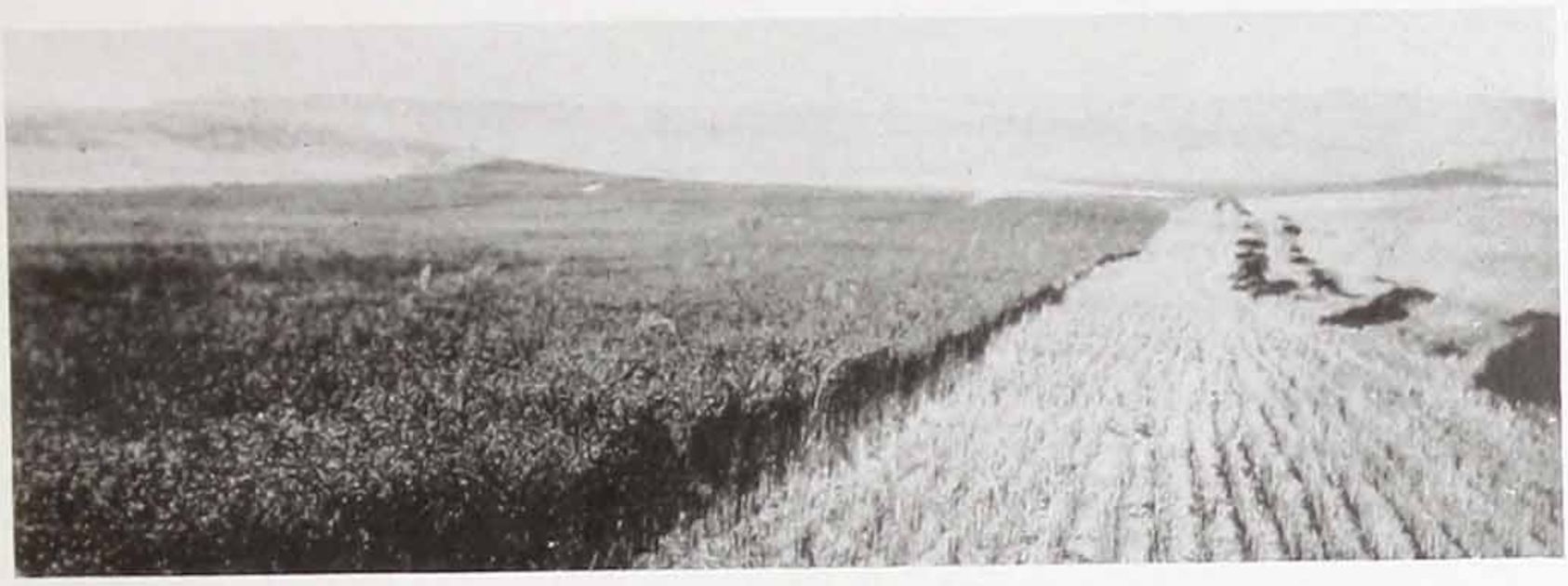
Spaniard Cutting Corks by Hand —Notice the amount of scrap

the natural cork, there is necessarily a great deal of waste involved. For instance, in producing bottle stoppers, from 60 to 65% of the raw material is, of necessity, reduced to scrap. These scraps of cork, however, are still valuable, as they form the principal ingredient of numerous by-products of great importance. The best and cleanest of the cork waste (as the scraps are called) is carefully collected, shipped to the mill at Lancaster, and there ground into flour and utilized in the manufacture of Armstrong's Linoleum.

Linseed Oil

Frederick Walton, of London, happened to notice the film or skin that had formed on the top of a can of paint which had been left open for several days. Picking the skin up and working it into a ball with his fingers, he was surprised at its toughness and elasticity. At once his active mind began to wonder whether this peculiar property of linseed oil—changing into a rubber-like mass when exposed to the air—could not be turned to some good purpose. Experiment followed experiment and the result was the invention of linoleum in 1863.

Linseed oil, from which linoleum takes its name, is extracted from the seed of ordinary flax. This useful plant has been cultivated for thousands of years. The most ancient records contain references to it. Linen woven from

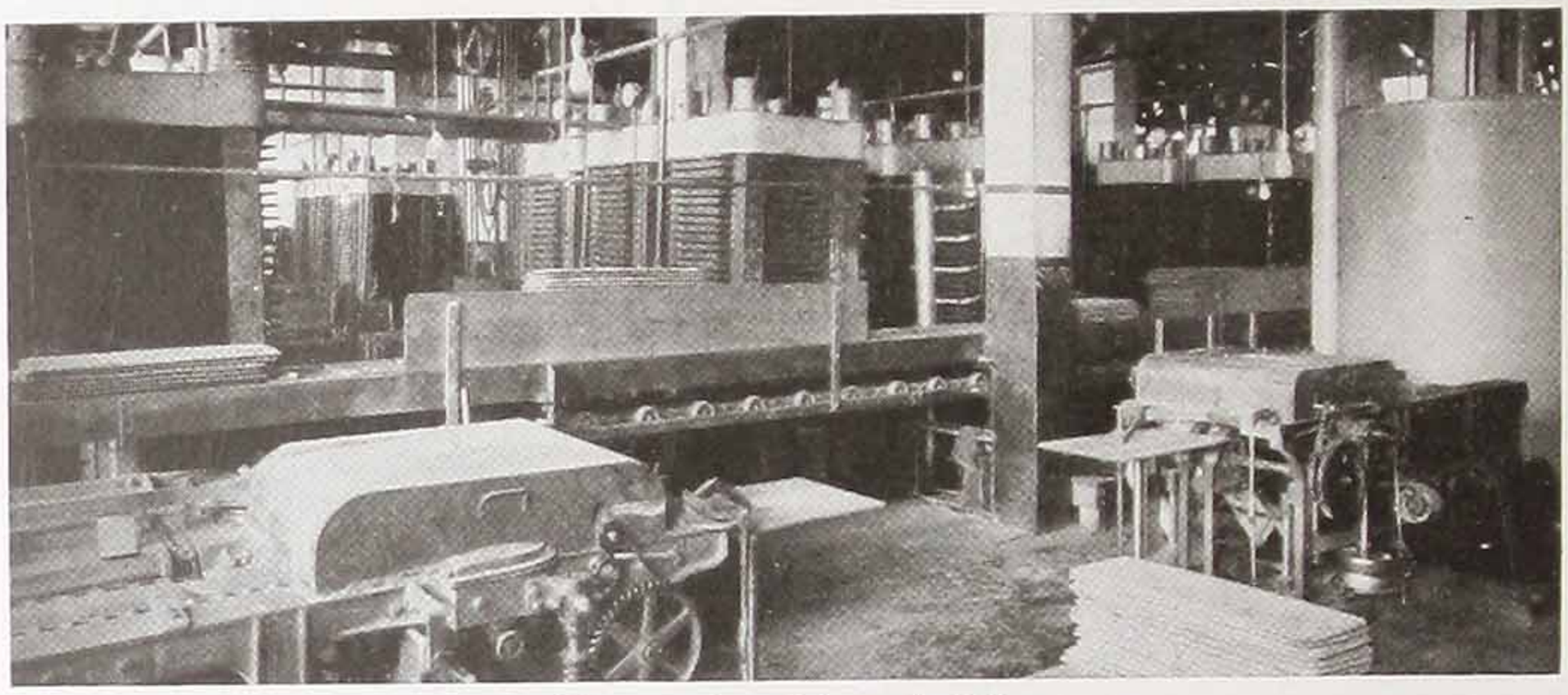


A Flax Field in North Dakota

its fibres was the official garb of the old Egyptian priests, and despite the introduction of cotton, remains the most desirable fabric for many purposes at the present day. The seed not only yields the most valuable drying oil known to commerce, but in some countries serves as an article of food. The Abyssinians eat it roasted and the oil is used as an edible in certain parts of Russia, Poland and Hungary.

Flax can be grown in any temperate climate. At the present time, the Argentine Republic is the largest producer. The section comprising North Dakota, South Dakota, Minnesota and Montana ranks second. Canada, India, Russia and Siberia complete the list of important flax-growing countries. The seed from the colder climates yields the better oil—that which comes from Russia, Canada and our own Northwest, being considered the best.

In the United States, flax growing has gradually moved west as new lands were brought under cultivation. While wheat cannot be grown satisfactorily on newly turned up sod, flax flourishes under such conditions. A half century ago it was grown extensively in the middle States—Ohio, Indiana and Illinois. Today, little or none, is produced in that section.



Expressing Linseed Oil

The seed is sown in May or June and reaches maturity in about three months. The plant, as a rule, grows to a height of about three feet, with a slender stalk and a multitude of branches at the top, which bear tiny, blue flowers. A field in bloom is a beautiful sight. When the crop is ripe, the flax is harvested and threshed like wheat. The seed is then ready for shipment to one of the oil crushing centers—the principal plants of this kind in the United States being located in St. Paul, Minneapolis, Toledo, Buffalo and New York.

In extracting the oil, the first step is to clean the seed thoroughly by blowing out the dust and dirt. It is then crushed between corrugated steel rollers, heated, and run onto small collapsible frames with mohair bottoms. These frames, containing the oil-bearing meal, are placed one on top of the other in large presses, and the oil then expressed by means of a hydraulic ram. The last step is the filtering process, after which the oil is run into storage tanks and from thence transferred to tank cars for shipment.

Every car of oil received at the Armstrong Linoleum plant is carefully tested in the laboratory before it is

accepted. Impure oil will not dry out or oxidize properly and its use would result in linoleum of inferior wearing quality and finish.

Burlap

From a Bengal swamp to an American home is a far cry, yet such is the case with the burlap that enters into the manufacture of Armstrong's Linoleum. The jute from which burlap is made comes from British India. It is the inner fibre—a skin-like covering of the pith—of plants that resemble reeds.

These plants attain a height of ten to fourteen feet. At the end of three months, when they have reached maturity, they are cut down and placed in natural pools or shallow tanks until the outer bark becomes quite soft. Standing waist deep in the water, a native dexterously strips off the whole bark without breaking either stem or fibre. Next he lashes a handful of these stripped stalks on the surface of the water to thoroughly wash off all impurities and then throws them upon the bank of the pool. Here other natives strip the fibre from the pith and hang it on lines in the sun to dry. When

Cultivating Jute in India

A Native Jute Baler's Yard in Calcutta—Where the jute is graded and baled for export

thoroughly dried, the fibre is packed in bales of about 400 pounds each, under hydraulic pressure and shipped to Dundee, Scotland, to be further treated and woven into burlap.

These bales are so tightly packed that on entering the mill, it is first necessary to pass them through a machine to open them up. From the "crusher" (as this machine is called) they next pass to the "softener." From its double-fluted rollers, the fibres emerge soft and pliable and are then combed to remove any woody matter that may remain and to make each fibre lie straight. The next machine converts the fibres into a continuous strand, which on the drawing frame is drawn out to great length. Next, the spinning machines twist it into yarn for the shuttles that fly back and forth, like living things, two or three times a second, and the loom gives forth the fabric known as burlap.

Used as a material for clothing by the poorer classes of India, it is now destined to fulfill a service for which it is far better fitted—to supply a strong, durable backing for Armstrong's Linoleum.

Weaving Burlap in Dundee, Scotland

Kauri Gum

One of the most expensive ingredients of Armstrong's Linoleum is kauri gum—the fossilized sap of the kauri pine from far-off New Zealand. These giants of the forest, sometimes as high as one hundred and sixty feet and twelve feet in diameter, centuries ago met a common fate. Fallen to earth, the amber sap that had coursed their veins, underwent certain chemical changes during its long burial and now is a commercial product of great value. But little more than half a century ago, it was considered practically worthless. As late as 1846, the captain of an American vessel took in a quantity of it as ballast for want of a cargo, and was obliged to pay storage for two years before a purchaser could be found.

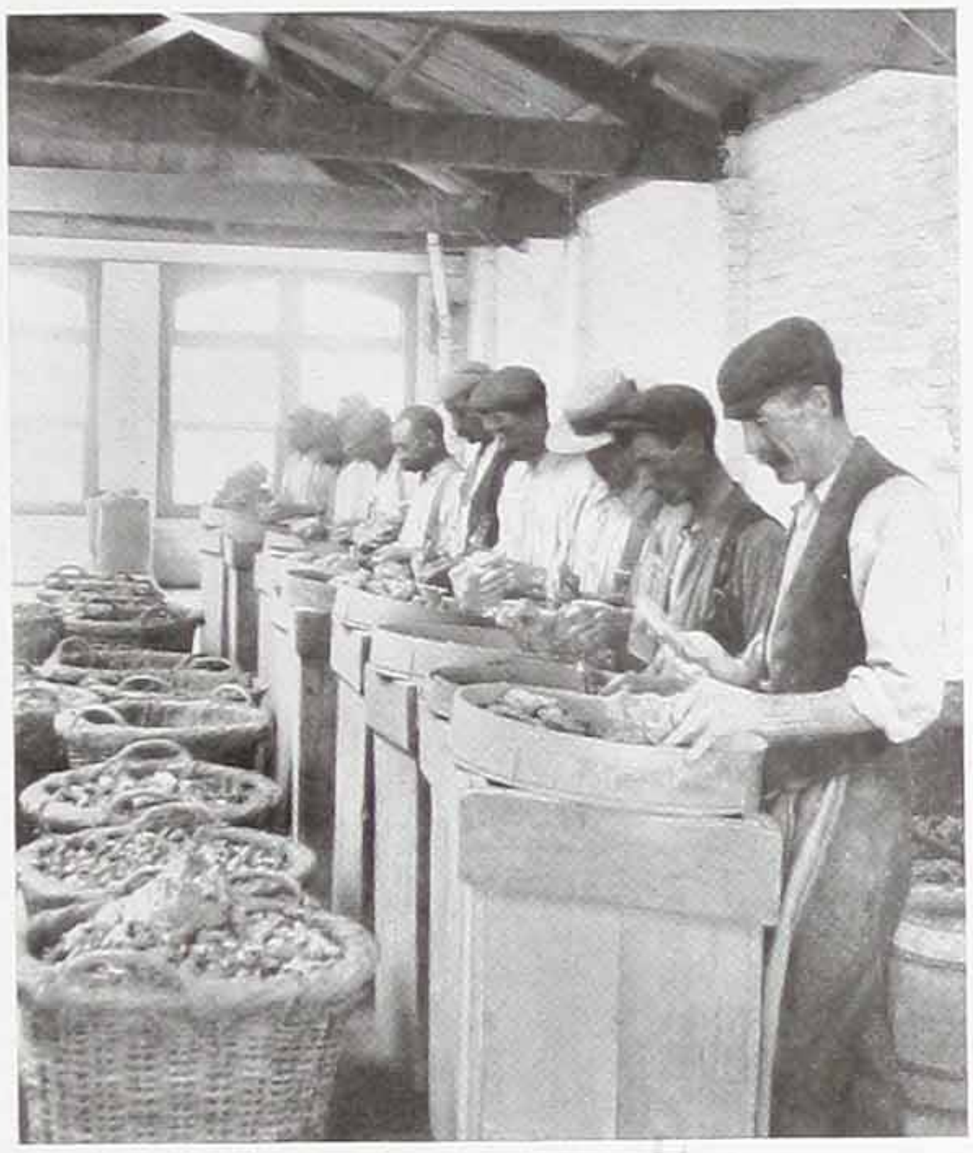
In the early days, kauri gum could be found protruding from the surface of the ground, and the task of gathering it was light indeed. Today, it is necessary to go to greater depths for the rich deposits and sometimes entire tracts of land must first be drained before the digging can proceed. The gum is located much as

Washing Kauri Gum in New Zealand

our fathers prospected for gold in the days of '49. The digger, his provisions in a haversack over his shoulder, equipped with a spear and a spade, traverses considerable areas. As he walks along, the spear is constantly employed in testing the ground all about him. If it strikes what experience tells him is gum, he immediately uses the spade to uncover the deposit. At night beside his camp fire, he carefully scrapes all earth from his finds, and when he has collected a sufficient quantity of the gum, retraces his steps to the dealer, who, after buying, rescrapes, sorts, and grades it, and sends it to Auckland where it is packed for export. Naturally, by this crude method of location, only the larger pieces of gum are found, and as settlements spread and the land is tilled, the farmer reaps a harvest in smaller bits that have escaped the notice of the digger.

The diggers are migratory. In the winter or early spring when the ground has been softened by the rains, they may be found on the hills. In the summer and fall, during the dry season, digging on the uplands becomes more difficult and the men flock to the swamps. Expert diggers earn from fifteen to twenty-five dollars a week and the cost of living is merely nominal. The work, however, is laborious and may result in small recompense through lack of experience.

A syndicate with full equipment of machinery for treating kauri gum now holds many of the best fields. A deep trench is dug, and large blocks of earth pried off and washed by means of a pump propelled by a small engine. However, hundreds of independent diggers may still be found plying their vocation according to the methods of years ago.



Sifting and Sorting Kauri Gum
Auckland, New Zealand

Colors

Volumes could be written on this subject, as the farthest corners of the earth are searched for the pigments and driers used in making Armstrong's Linoleum, and the tale of how each is produced, would in itself make a fascinating story.

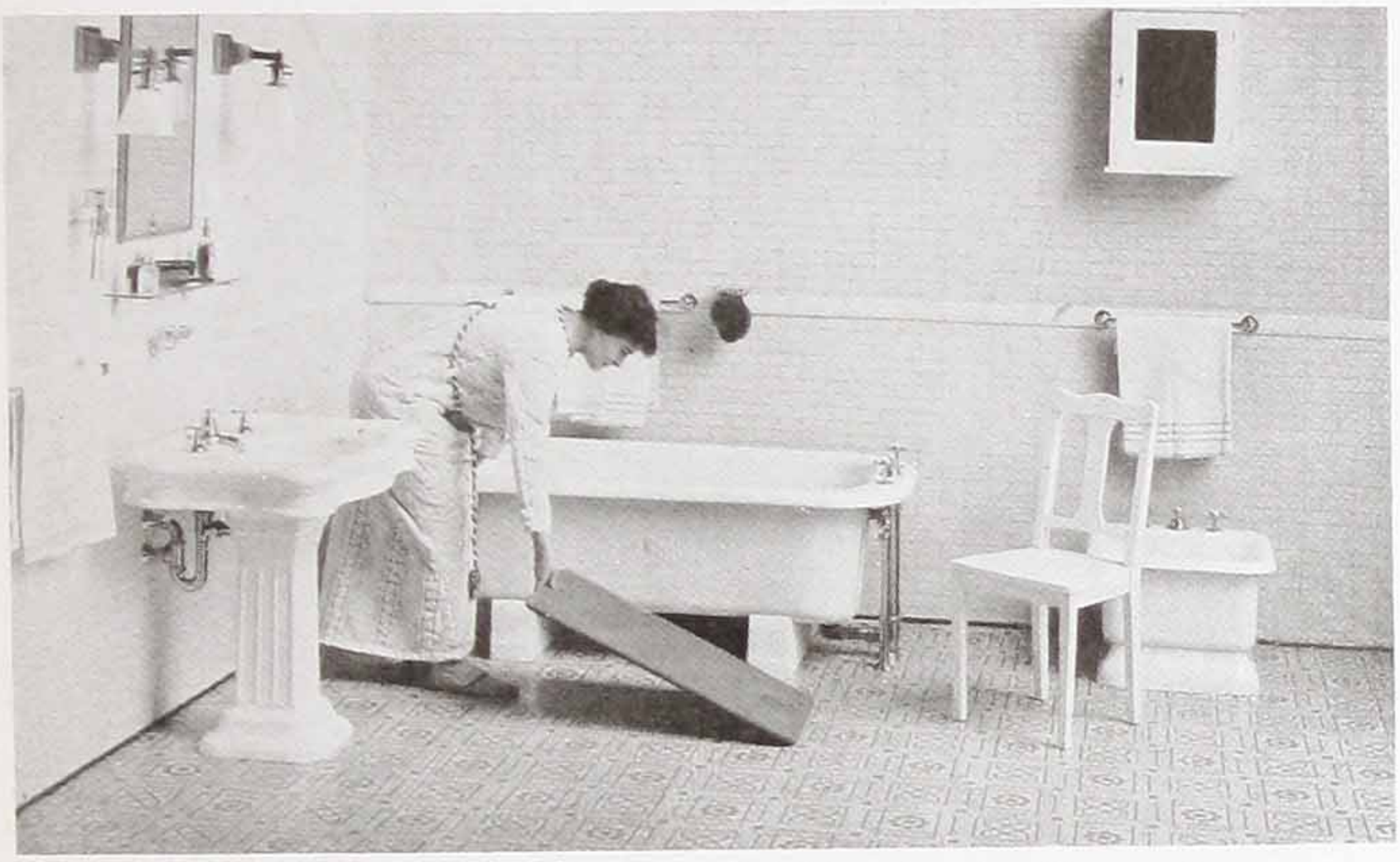
North America, South America, Europe, Asia, Australia—all are represented in the warehouse where the colors are stored. Brilliant reds from Persia and Germany are found side by side with tawny umber from the Island of Cypress and siennas from Italy and England. Chrome yellows from Australia mingle with soft ochres from France, and rich browns from Holland rub elbows with zinc white from Missouri, New Jersey, Wisconsin and Colorado.

The myriad-hued coal tar colors of Germany—by-products of the coke oven, are utilized in making some of the more delicate shades, while ore from the mountains of Spain is used in others. Then there's resin from the pines of Carolina and Georgia, whiting from the chalk cliffs of Dover in England, lead pigments from the mines of the Ozarks, and a host of other materials. Even far-off Chile supplies an ingredient that helps make the coloring of Armstrong's Linoleum brilliant and lasting. When it lies on the floor before you, the color treasures of the world are at your feet.

How to Put Down Linoleum

The life of linoleum is reduced and its appearance frequently spoiled by carelessness in laying it and improper treatment. By asking your customers to observe these simple directions, such trouble may be avoided.

Never a complaint about linoleum that's laid like this—Tell your customers how the work's done



Polishing linoleum keeps the colors bright and makes it wear longer —Do your customers know how to do it?

Over Wood Floors: All wood floors over which linoleum is laid, should be well-seasoned, and must be made smooth and even, if the material is to give satisfactory service. This is absolutely essential—the cloth is apt to break otherwise.

In putting down the linoleum, cut it so as to allow for expansion, that is, do not attempt at first to make it fit tight. For after having been rolled up for several weeks or months, it is bound to continue to "grow" for some little time after it is laid out flat. So let it lie loose on the floor for at least two weeks, giving it plenty of time to expand as much as it wants to. If this precaution is not observed, the linoleum is apt to buckle, which not only gives it an unsightly appearance, but also reduces its life in service.

After expansion has ceased, fit the linoleum closely and either tack or cement it down. Waterproof cement

made especially for this purpose can be secured from the Armstrong Cork Company. The cement method is really the better of the two, and by suggesting this to your customers you can frequently secure orders for laying linoleum with that much additional profit to the house.

In cementing it down the preferable way is to coat the entire back with cement—not merely the edges and seams. A gallon of cement will ordinarily be sufficient for ten square yards of linoleum if the whole back is coated; while the same quantity will be enough for approximately twenty-five square yards, if only the edges and seams are cemented. In applying the cement, the best way is to coat both the floor and the back of the linoleum; then when the cement has started to set—say five or ten minutes after it is applied—stick the linoleum in place. If any cement should get on the surface of the goods, remove it *at once* with alcohol.

The whole surface of the linoleum must be weighted down uniformly until the cement has fully set. For

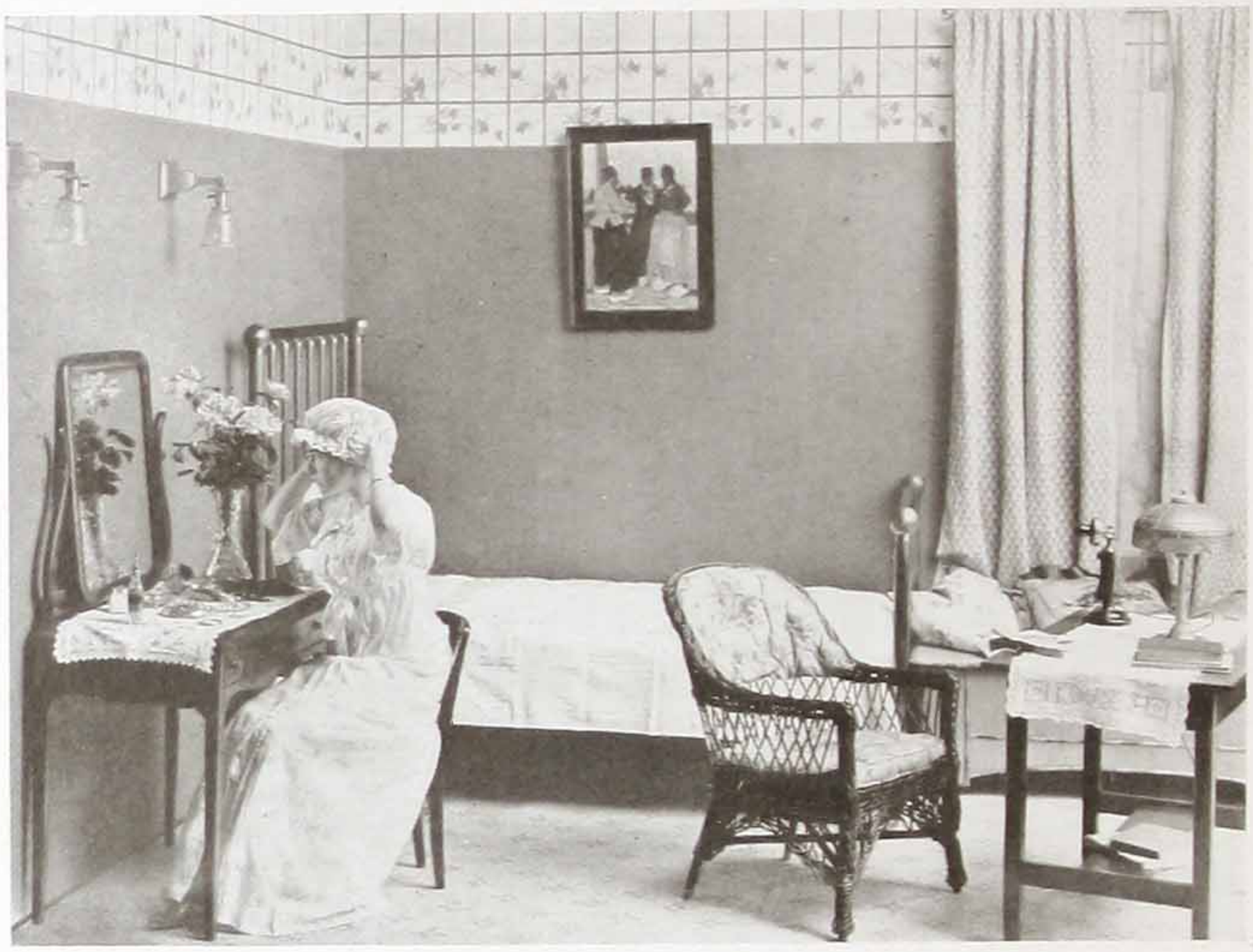
Nothing better for laundry floors than Armstrong's Linoleum

this purpose sand bags, made of ten ounce duck, 14 inches square, and weighing about 26 pounds each, will be found useful. The weights should not be removed for at least twenty-four hours after the linoleum is laid. As an additional precaution the linoleum should be nailed down with No. 18, ¾-inch brads spaced about four inches apart along the seams and around the edges. Carpet tacks should never be used, as they are very unsightly.

Even if you cannot persuade your customers to lay their linoleum with waterproof cement in the manner just described, at least urge them to use the cement around sinks, wash-tub legs, in front of door-ways, and at other places where water is apt to gather. If linoleum is to wear properly, it is absolutely necessary to keep moisture from getting underneath it. As this is a fruitful source of trouble and complaint, it will well repay you to warn your customers against it.

Over Concrete Floors: The surface of any cement floor over which it is proposed to lay linoleum should be smooth and the concrete well seasoned. Even where the concrete appears to be perfectly dry, there is sometimes enough moisture left to affect the burlap back after the linoleum is put down, causing it to shrink instead of to expand. In the case of concrete floors it is therefore always advisable to let the linoleum "ride the base" for at least two weeks before any attempt is made to fit it closely. By this is meant that the goods should be cut full—allowed to curve up against the walls an inch or two all around the room. Furthermore, the seams should be lapped slightly, care being taken with figured patterns not to lap them enough to spoil the symmetry of the design.

After all shrinkage or expansion has ceased, fit the linoleum closely and cement it down with waterproof



The Armstrong Line includes "Patterns for Every Room in the House"

cement, covering the entire back. The material must, of course, be weighted down uniformly over the whole surface until the cement sets thoroughly. For this purpose, sand bags or props wedged between the floor and the ceiling should be utilized.

Two Other Important Points: When linoleum is installed in offices, stores, or other places where the furniture is heavy, dome-shaped glass shoes should be substituted for the castors, for the castors will inevitably cut through. This is particularly true of desk chairs. The sliding glass shoes have a wide bearing surface and no rough edges. They are made in several sizes, have a similar shank to that on a regular castor and will fit in the same sockets.

The other point is this: In cold weather, linoleum becomes hard and brittle, and if unrolled when in that condition, is apt to crack. Caution your customers, therefore, when they buy linoleum in the winter months to keep the roll in a warm room for at least forty-eight hours before unrolling it.

How to Take Care of Linoleum

In washing linoleum, soda, lye, potash or strong scouring soaps should be avoided, as they tend to rot the goods and destroy the colors. A mild soap—free from alkali—with clean tepid water, is the only cleansing agent that should be used. The water should not be hot and the linoleum should be dried thoroughly immediately after it is washed. It is best to wash and dry about one square yard at a time.

The life of linoleum can be prolonged and the brightness of the colors retained and renewed by going over the surface occasionally with some good polish—being sure to *rub it in* thoroughly. "Liquid Veneer," "Linoleum Reviver," or any good floor wax can be used for this purpose. A home-made polish that yields excellent results is easily prepared by dissolving under slow heat, one part of beeswax in two parts of turpentine by weight. Care must be taken of course, to avoid setting this mixture on fire, while preparing it. If American housewives could but visit a few homes in England and Germany, where linoleum is always kept polished, they would realize at once how greatly such treatment improves its appearance.

The Armstrong Library

of Linoleum Selling Helps

Four other interesting and forceful booklets have been prepared to help you sell more linoleum. These aids to business are of exceptional merit, interest, and practicability. One and all are free for the asking.

Armstrong's Linoleum Advertising

Ready-to-use advertisements for the hurried ad-man. One, two and three column sizes that present splendid selling talks. Illustrated with clever cuts showing the uses of linoleum—cuts that will be furnished—free of charge. Suggestions for other forms of publicity. A book every advertising man should have on his desk.

Armstrong's Linoleum Displays

A valuable volume of ideas and illustrations for the window trimmer. Contains pictures of telling displays and explains how to make them. The Armstrong Educational Display—a show window object lesson on the making of good linoleums—is one of the features. This book shows display managers, window trimmers, etc., some new and novel ways of overcoming the display difficulties in handling linoleums.

Armstrong's Linoleum Slide Service

This booklet shows a series of novel advertising lantern slides, embracing humorous and dignified presentations of the merits of Armstrong's Linoleum. The slides are furnished free, imprinted with the merchant's name and address. They are illustrated in color in this booklet.

How to Lay and Care for Linoleum

Booklets for Your Customers

These attractive booklets, printed in colors, tell in a practical and understandable way how to lay and care for linoleum. Two hundred copies will be supplied free of charge to retailers selling Armstrong's Linoleum, with the merchant's name printed on the front cover. For additional quantities a nominal charge is made.

Copies of any of these publications will be mailed free for the asking

Further Information

Requests for further information or suggestions will be given prompt attention. Address all inquiries to

ARMSTRONG CORK COMPANY
Linoleum Department
Advertising Bureau **Lancaster, Pa.**

The Armstrong Line

Among the products manufactured by the Armstrong Cork Company are the following:

Corks of every description

Washers and Gaskets

Bungs and Taps Insoles Handles

Bath and Table Mats

Life Preservers Buoys

Yacht Fenders

Armstrong's Linoleum—plain, printed and inlaid

Nonpareil Cork Floor Tiling—for libraries, museums, billiard rooms, bath rooms, etc.

Armstrong's Linotile—for flooring offices, banks, theatres, kitchens, pantries, elevators, etc.

Cork Paving Brick—for stables, shipping platforms, warehouses, etc.

Nonpareil, Acme and Eureka Corkboard—for insulating cold storage rooms

Nonpareil Cork Covering—for cold pipes

Nonpareil High Pressure Covering—for steam lines, boilers, etc.

Nonpareil Insulating Brick—for boiler settings, furnaces, retorts, ovens, etc.

Machinery Isolation—for deadening the noise of fans, pumps and motors

Granulated Cork

Cork Specialties of every description

Prepared by
ARMSTRONG CORK COMPANY
Publicity Department
Pittsburgh, Pa.

Printed by
The Corday & Gross Company
Cleveland